RAILROAD GAZETTE

FRIDAY, OCTOBER 17.

Contributions.

Locating a Crossing with Reversed Curve Between Parallel Tracks.

EAST INDIA, Aug. 15, 1884.

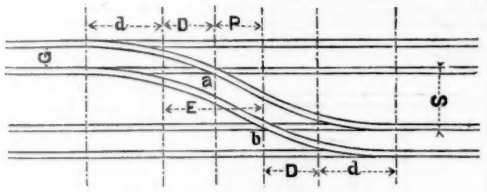
TO THE EDITOR OF THE RAILROAD GAZETTE:

Last mail I wrote criticising Mr. Anderson's replies to my query. If the letter has not already appeared in print will you please consider it cancelled, as owing to our copy of your esteemed paper having gone astray I did not see Mr. Anderson's letter and formulæ until after I wrote, although a friend had sent me the answers given by that gentleman some time ago.

On looking at the formulæ I find that my suspicions were correct, viz, that the head of rail, 2½ in., was left out in calculating the distance. This of course was partly my fault, for not explaining myself more clearly.

I have worked out the cases given, and get for No. 1, lines 20 ft. apart, or 20 ft. 5 in. inside to inside of rails, 168.3 ft.; for No. 2, lines 6 ft. or 6 ft. 5 in., inside to inside, 114.34 ft.; for No. 3, lines 6 ft. or 6 ft. 5 in., inside to inside, line between crossings straight, 114.43 ft., and these results are nearly correct, both in theory and practice.

Still the rule is open to this *one* objection on English and Indian railways where *split* rail switches *only* are used, and consequently the switch rail is never of the correct the-



oretical length, except with very sharp curves; 12 ft., 15 ft. and 18 ft. are the usual lengths, and 20 ft. very seldom. Anything above that will not work satisfactorily.

Most railways use a double chair at the heel of switch, giving 2 in. clearance between the rails, and the heel of switch is therefore the only fixed point, and all measurements are taken from it.

Many men do not know anything about the theoretical length of switch, or point of curvature, and consider that the latter *commences* at the *toe* of switch, and in using Mr. Anderson's formulæ they would certainly measure from that point, and this would throw the work out, as the switch rail would probably be 15 ft. or 18 ft. instead of 28 ft. 7 in. for a 1 in. 10 crossing. This is the reason that I asked for a rule to give nose to nose of crossing. Mr. Summerson, of Darlington, gives the following formulæ, but I have not had time to try it yet:

$E = \sqrt{(r \times 2S - S^2)} - d.$

$P = E - D.$

r = radius of turnout curve.

S = distance between the lines, measured from *inner or gauge side of rails.*

d = spring of curve to heel of switch.

D = heel of switch to point of crossing.

P = point of one crossing to a point opposite the nose of the other.

E = distance from heel of switch to nose of crossing b.

I hope some of your readers will try this, also the rule by Mr. Jones, sent in my last, and will some of them also give me a rule for determining the distance from heel of switch (to point of curvature) to nose of crossing, when two curves curve in *opposite* directions; also where they curve in the *same* direction?

I have prepared a set of tables, and will be glad to exchange with any one. Every table has been tried *practically* before being considered correct, but some that I have in practice I cannot find a rule for. For instance, two crossings, 1 in 10 and one 1 in 7 roads to curve in opposite directions, and toe of one switch to be behind the heel of the other, so as to avoid the old method of three throws. This style is *safer*, and takes very *little more* room.

INQUIRER.

LAMBERTVILLE, N. J., Oct. 9, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

"Inquirer," in the *Gazette* of Oct. 3, appears not to have seen my article, reprinted Dec. 7, 1883, with the figures, which were omitted in the publication in November. A reference to the figures will make clear what was obscure, indicating that the distance, 167 ft., is measured from the point of curvature to a point on the straight rail opposite to and at right angles from the theoretical frog point. It will also appear that "Inquirer" is correct in supposing that 114 ft. is the distance from one frog point, or "crossing," to a point opposite the other. The direct distance between these points is of course the hypothenuse of a right-angled triangle, of which 114 ft. is one side and the width between tracks the other. An examination of the numerical formula will show that the value of D is more accurately 166.995 ft. The difference between this and 167 was not deemed important in stating the result. The distance between tracks was taken as between gauge lines, as is usual, and not between outside of rails. If the width of the rails, of 2½ in. each, is added to the 20 ft., the formula will then be

$$D = \sqrt{11 \times 100 \times 25.917 - \frac{25.917^2}{4}} = 168.35.$$

The point of curvature from which the measurement is made is assumed to be identical with point of a point switch. If there is any difference it must be allowed for in placing the switch. Stub switches are now generally placed by using a rail longer than the part to be moved and spiking up the end to the point of curvature or near it. The movable end is located with reference to the exact point of curvature. A convenient formula for the length of switch rail L, with a given throw t and frog number n with gauge g, is

$$L = 2n\sqrt{gt}.$$

This omits unimportant fractions. With very acute frog angles the result is inconveniently long, and a convenient length must be arbitrarily taken, resulting necessarily in a slight inaccuracy in the curve.

Returning to our formulæ for crossings, that for the width of 6 ft. between tracks also requires modification if the width of rails is to be added. I produce it here correctly, as at first designed, and also with the width increased by 5 in.

For gauge 5 ft. 6 in. and width 6 ft. between gauge lines:

$$D = \sqrt{11 \times 100 \times 11.5 - \frac{11.5^2}{4}} = 111.88.$$

For 6 ft. 5 in. between gauge lines

$$D = \sqrt{11 \times 100 \times 11.917 - \frac{11.917^2}{4}} = 114.33.$$

From 114.33 deduct, as before, the "lead" $= 2gn = 110$ ft., and we have 4.33 as half the distance from one frog point (theoretical) to a point opposite the other, making the whole distance 8.66 or 8 ft. 8 in. J. A. ANDERSON.

White Light Signals.

WEEHAWKEN, N. J., Oct. 6, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The letter on the subject of "White Light Signals" addressed to the Association of American Railroad Superintendents at their last convention treated of a matter that should be fully understood by all in the transportation department of our railroads.

In the railroad service there is nothing more vitally important than the signal codes governing the whole system of train service according to voluminous and intricate rules. The most available and reliable code of signals is formed by attributing certain meanings to chosen colors, as the day and night representation *can* be made exactly similar. In arranging a uniform system of signals as great attention should be paid to the uniformity of the signals themselves as to the uniformity in the meaning to be conveyed, and in perfecting the system the size and the range of observation should be taken into careful consideration.

In general practice colors are used as signals in the form of flags and screens, painted targets, semaphore arms, and mechanical arrangements, and at night by the illumination of fabrics, or of glass in the shape of flat sheets, globes and lenses. The sizes, shapes and resulting ranges of observation are innumerable, but in all the cases the day and night representations display the same color to the eye, with the single exception of the white signal. Next to red, white is the most important color in the code, and yet the unmistakable white of the day signal is represented at night by a simple flame. This practice undoubtedly grew into the service at a time when it was not likely to lead to misunderstanding, but to-day it is an undeniable source of error, as every practical trainman will admit, and should be corrected, if possible.

Those who work out of doors at night must have a light that is safe to carry and is protected from the wind and weather, such as a lantern, and the clearer the protecting glass globe the more light will be afforded when used as a light, and the more prominent when used to portray motion signals. Such a *clear* light is indispensable on a railroad, but it does not represent the white of the day signal as the ruby light does the red signal. The illumination of a white screen, white porcelain, or even ground glass does exactly reproduce the white of the day signal, and the agreement that such a white is to be the night safety signal will not interfere with the present use of ordinary hand lanterns to portray motion signals.

The principal argument that I have heard against the use of an opaque white at night is that such a signal could not be seen far enough. I think I am safe in saying that the best range for any signal is *that it can be seen just far enough and no further.*

If one signal could be seen further than another, the relative position could not be determined, and an observer would be liable to form a wrong impression that might lead to serious consequences. In fact, in our night practice *white* lights are frequently visible to approaching trains before intermediate green or red signals become visible, and this sometimes results in mishaps, to say nothing of the sudden checking of speed to the discomfort of passengers, and the risk of breaking running gear. If any difference in the range of signals is desirable, the danger signal certainly should be so treated by enlarging the flags and screens, or by the use of lenses so as to insure its being the most prominent and discernible, for the slacking of speed on account of a red signal being seen before an intermediate white signal would be an error *on the safe side.* The next in prominence should be the caution signals, and the least prominent and the most reluctantly displayed should be the safety signal.

In the proposed system of uniform train signals, white borne on the locomotive is named as the signal to designate extras or wild trains. This signal has been in use on the Pennsylvania Railroad for this purpose for many years, and many specific instances of wrecks have occurred on that road by ordinary hand lanterns in the hands of men riding on the locomotives of regular trains being mistaken for white signals. The light of an ordinary hand lantern would never be mistaken for the globe of an opaque white lantern.

The abstract points of superiority all seem to me to be in favor of the change, especially as it necessitates absolutely no change in the present rules in force or suggested, and no waste or extra cost of material—simply the general agreement to represent white by white, and to attach no significance to a simple light except when it is in use to portray motion. White muslin and thin white paper to paste upon glass are within the reach of all that are inclined to experiment, and there are no patent royalties to be paid if adopted. JOS. E. RALPH.

Lack of Confidence in American Railways.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The cable has brought from abroad within the past three months, in various forms, the statement that European investors have no longer any confidence in American railways.

While this statement can scarcely be true in its broadest sense it it without doubt an indication of a lack of confidence in railway management in this country among those whose capital has heretofore been chiefly relied upon to take the bonds, at least, of our railway companies.

It may be worth while to inquire, first, Is this sentiment justified by the facts? second, What are its causes? and third, its remedy. That there is good ground for a lack of confidence is, unfortunately, too manifest.

Your editorial of July 18 upon "Fluctuations of American Railroad Stocks," shows a most extraordinary decline in the prices of several leading stocks, and accounts for it largely by reference to the phenomenal growth in trade, manufactures and consequent transportation which characterized the period from 1879 to 1881, and the succeding and partially consequent depression of 1883-84. But the unusual demand for manufactures, particularly of iron and steel, was largely due to the rapid construction of railroads during the years 1879 to 1882, which construction, if due to an actual need for additional channels of transportation, was proper and legitimate. But was it Was it not, on the contrary, maiuly stimulated by the illegitimate and, in many cases at least, *morally* fraudulent profits to be realized by the projectors, who usually became directors, officers and construction contractors in their own persons? While many railroads were constructed under this stimulus, which will ultimately benefit the country through which they run and in time become profitable, many more were built when there was no legitimate need for them, to the profit of their projectors and the loss of their investors. The receiverships of 1884 testify to this latter fact all too plainly.

The writer was informed of one such road, built by a contractor for the "syndicate" at a cost of $25,000 per mile and turned over in running order, which was "put upon the market" by the "syndicate" with $50,000 of bonds and $50,000 of stock per mile. What wonder that in less than a year a receiver was appointed? But meanwhile the "syndicate"—which was practically the board of directors—had "got out," and the investors now "have no confidence in American railroads."

A true and specific history of the projection, construction and sale of the bonds and stock of the railroads built since 1879, would form a record much more creditable to the "sharpness" of their projectors than to their honesty or ability as railway officers and directors. I may furnish a sketch of one or two of these in a subsequent communication. Mr. Poor, in his Manual for 1884, just issued, refers to this subject as follows:

"It is not probable that the cost of the mileage constructed in the three years equaled the increase of funded and floating debts by at least the sum of two hundred million dollars. The cost of the mileage constructed certainly did not exceed $30,000 to the mile. The whole increase of the share capital (nearly one thousand millions) and a portion of the funded debt, was in excess of cost of construction."

This is a fearful indictment against the ruling policy in railway enterprises drawn by one whose observation of and experience in the subject matter, for over a quarter of a century, entitles his views to respect.

While Mr. Poor may not have allowed enough for improvements—"betterments" so-called—put upon the older lines of railroad, it is undoubtedly true that, as to most of the new lines recently constructed, the bonds issued represent more than the whole cost of construction, leaving the stock as profit to somebody.

The presidents of railway companies are not, as a rule, men who are familiar with the management of such property. They are generally either self-selected—being persons who, having made up a "blind pool" or otherwise succeeded in getting control of a majority of the stock, put in their own friends, adherents or members of the pool as directors who proceed, *nem. con.*, to elect the chief manipulator President—or, on the other hand, they are persons selected by a few leading stockholders for their supposed ability to "boom the stock," regardless of any knowledge of the property or supposed ability to so manage its operation as to make the stock profitable as an investment.

The manner in which (as you point out in your editorial

before referred to) the stock of so many of our leading railroad companies is held, as a purely temporary investment by parties who "buy it for a rise," and, what is worse, the manner in which it is "sold short" frequently by the very officers and directors whose legal duty it is to do all in their power to enhance its value, makes the permanent value of the stock as a dividend-paying investment a matter which does not enter into their—the aforesaid officers' and directors'—calculations.

How many of the Presidents of our leading railroad companies, think you, know aught of such questions as the effect of a ruling grade upon the economy of traffic, the value of back loading as an element in economy, the development of local trade, the importance of having fully loaded trains, the value of increased average mileage of cars, not to mention innumerable details, which must be decided upon some general policy which the President must indicate.

But it will be said, "These are questions for the General Manager, the General Superintendent, the Division Superintendent, Chief Engineer. The President employs men in these positions capable of deciding all these matters; why should he need to understand them?"

Yet the fact remains that the President as the chief executive officer of the company, has to decide its policy, and, as a matter of fact, his decision is required to settle all the vital or important questions involving revenue and expenditure, and as he decides wisely or otherwise the company is prosperous or the reverse. The impression is altogether too prevalent that any successful lawyer, merchant or speculator is qualified to be President of a railroad company.

The management of an important line of railroad is a very complex problem, involving many intricate questions, sufficient to tax the most experienced mind; and yet its supreme direction is often confided to absolute ignorance of all such questions, even of their existence; too often to the speculator, whose knowledge of them is just sufficient to use them as pawns to affect the issue of his game. We do not find our eminently successful merchants among men whose knowledge of business was gained in farming until middle age; nor are our eminent lawyers or physicians found to be those who "took it up" after making a fortune as merchants. By just as much as the training of a soldier was found during the civil war to constitute the foundation of greatness in a military capacity, by just so much does knowledge of railroad business and management qualify a person for being President of a railroad company. By familiarity with the management is not meant that he should have started as a brakeman or track-hand; for education is a preliminary step to properly filling any important position in railroad management, and the educated young men do not, as a rule, take service as brakemen; but the President should understand the duties and responsibilities of the Superintendent, Chief Engineer, General Freight Agent, General Passenger Agent and Auditor, and experience in either or all of those positions is a valuable qualification. Were the persons selected as presidents selected upon such qualifications, we would not see them using the funds of the company to sustain the value of the company's stock, as in a recent case, while the example of Northern Pacific is a case in point, the present President of which was selected for his knowledge of the duties which he had to perform, while his predecessor in office was elected through the medium of a "blind pool."

But what is the remedy? In the selection of presidents it can only be brought about through an enlightened public opinion. The example of the Pennsylvania Railroad Company is a good one to follow. That company has its annual meeting of stockholders, at which the President's report is read and discussed, and a committee of stockholders is appointed to make nominations for directors. At an adjourned meeting a month later, the committee reports, the election is held, and the board they nominate is elected. The presidents of the Pennsylvania Railroad Company have all been men experienced in railroad management, and their policy has made the road what it is—the leading railroad in the United States. But Pennsylvania Railroad stock is not on the New York stock board.

The investing public can, if they will, remedy the foisting upon the market of issues of bonds, in excess of the whole cost of a road. But few railroads in this country, when opened for traffic have cost in cash honestly expended in excess of $30,000 per mile of single track. When bonds are offered in excess of $20,000 per mile, by no matter how respectable a banking house, investors should inquire closely, and decline to buy without a favorable report by a competent expert, employed by themselves, or at least free from any bias in favor of the company.

When this course is pursued the vocation of the Railroad Projector and "blind pool" President will be at an end.

Sparks and Platform Roofs.

NEW YORK, Sept. 11, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The reading of the articles in recent numbers of the *Gazette*, especially in the issue of Aug. 1, calls to my mind some precautionary measures taken heretofore upon roads with which I have been connected. I remember an instance when a caboose car was transformed into an inspection car for the use of the road superintendent. This had an awning at the rear end. The road used wood-burning engines, and the awning was continually burning up. A board was put across the rear end on the roof as indicated in the inclosed sketch (Fig. 1), which saved the awning, the sparks being deflected upward and falling only far beyond the awning.

I have known a similar attachment to be used on a caboose car of a road in Southern Ohio with which I was connected, the board in each case being about one foot in height and set back one or two feet from the end of the roof.

I give you in another sketch (Fig. 2) the suggestion which

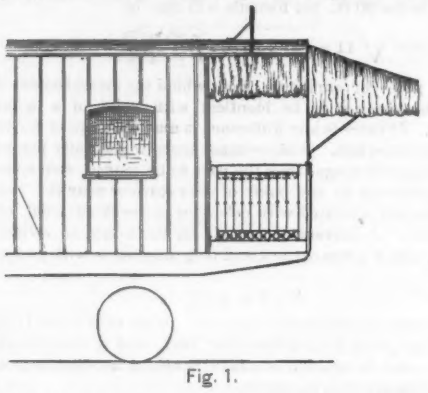


Fig. 1.

occurs to me as to the lesson to be drawn from this in respect to the finishing of passenger-car roofs. By setting up a vertical board at the end of the roof the wind and sparks which now pass down between the cars and strike against the front end of the rear car will be caused to drop their sparks behind the board or if any pass down between the cars it will be in a nearly vertical direction and with little velocity.

F. L. GRISWOLD.

[The accompanying engraving (Fig. 3) had been already made for publication from a sketch drawn seven years ago, and was to be published as an amendment to Mr. Griswold's suggestion, when the descriptions and drawings of the Reynolds dust guard, given elsewhere in this number, were received and served to confirm the idea embodied in our sketch. What we might have said in presenting it is set forth more fully in that description, namely that the true lesson to be drawn from his experience is that an upward instead of a downward turn should be given to the ends of passenger cars. Besides avoiding the annoyance and injury from dust and cinders, it might cause a reduction of train resistance of appreciable importance to high-speed trains, especially if the same principle were extended to the corner post of the car for its entire length. A possible objection to this course, however, even if otherwise effective, is the danger to those standing between the tracks if the available open space were encroached upon.—EDITOR RAILROAD GAZETTE.]

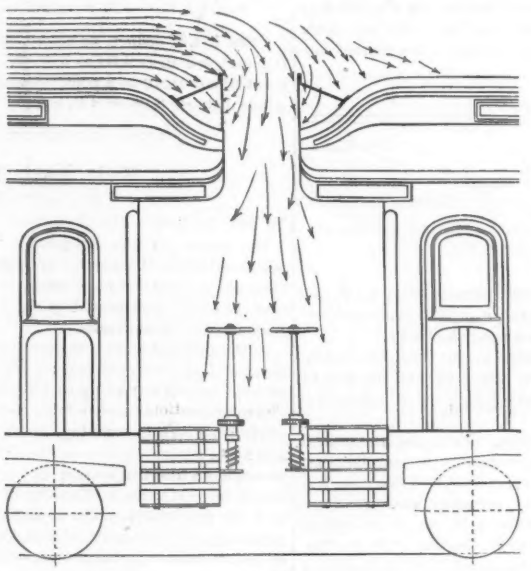


Fig. 2.

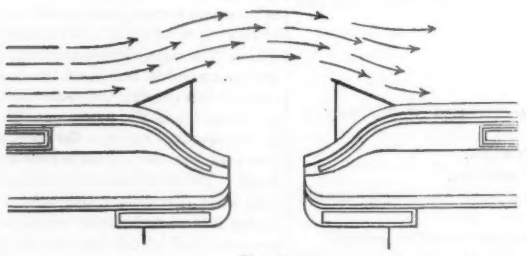


Fig. 3.

Reynolds' Dust Guard.

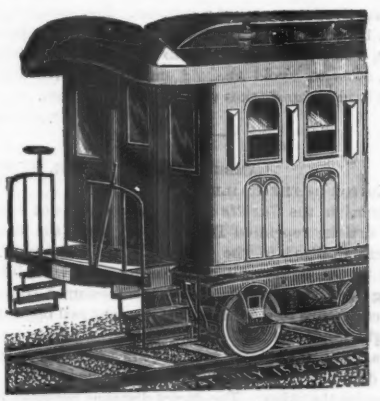
The problem of preventing cinders and dust from falling upon car platforms, and either collecting there in large quantities or being driven into the cars through open doors, to the great annoyance of passengers, and injury of the paint and fittings, is not new, but as every railroad man knows no very satisfactory remedy has as yet been introduced. A partial remedy has been sought in the use of a vertical galvanized-iron hood dropping down a foot or more from the platform. This in a measure mitigates the evil, but is far from overcoming it.

The plan illustrated in the engraving herewith is decidedly a new departure, since it grapples with the evil to be cured in a reverse manner to that now usual; that is, it gives in effect an *upward* instead of downward turn to the end of the platform roof, the idea being that when the current of air and dust and cinders strikes the rib upon the rear end of the forward car, it will be deflected upward and pass entirely over the similar rib upon the front end upon the following car, so as not only to prevent the gust of descending air which is now so disagreeable, but to cause, if anything, an upward current of air instead.

It is but a step from this conception to that of a similar application to the window panels along the side of the car, so as to prevent the entrance of dust-charged air at the open windows. Such ribs between the windows are also shown in the engraving. That they would presumably accomplish the end desired, in part at least, might be inferred from the window ventilator-boards which have been more or less in use for many years on passenger and sleeping cars. These boards, as most of our readers know, are portable, to be inserted only when the window is opened and project perpendicularly outward two or three inches beyond the side. The difference between the two devices is that the Reynolds attachments are fixed instead of portable, and have a beveled face instead of one at right angles to the car. Whether this increases or decreases its efficiency can only be determined by experiment, but it seems probable that it makes little difference, the total projection being the same.

Both roof and window guards may be made of galvanized iron, zinc or wood, and so arranged as to be readily removed from the sides or roof of the car when desirable They may be painted, of course, to harmonize with the color of the car. The roof-guard shown in the engraving is merely a provisional form.

In case the space between windows is narrow, only one guard need be used. When the panel is wider two may be



REYNOLDS' DUST-GUARD.

used. They are intended to project about 3 in. from the side.

The patentee of these devices is Mr. J. H. Reynolds, of

Troy, N. Y., inventor of the well-known "Globe" ventilator. The patents were granted July 8 and 22, 1884.

With a communication in another column entitled "Sparks and Platform Roofs" we have published a sketch embodying precisely the same principle, which had been prepared and engraved for some time before the existence of Mr. Reynolds' devices had become known to us. The engraving, it may be added, was copied from a sketch made seven years ago in which the same principle applied to window-guards was also shown.

The Reynolds dust guard has been tried on local trains of the Delaware & Hudson Canal Co., between Albany and Troy, with, it is said, very satisfactory results. The nuisance it is intended to abate is one of the greatest discomforts of railroad travel, and anything which will remove it will be most welcome.

The Brotherhood of Locomotive Engineers.

The following are extracts from the annual address of Grand Chief Engineer P. M. Arthur as delivered at the opening session of the annual convention of the Brotherhood in San Francisco:

Looking back over a period of 21 years to the time when a small band of men met together in the city of Detroit, Mich., for the same noble purpose which has drawn us here at this time, and then again reverting our glance to what lies before us we are almost impelled to exclaim, "Impossible that so small a beginning reach in comparatively so short a time such stupendous proportions;" and we are compelled to breathe a word of thanksgiving and gratitude to Him who helps those who help themselves. * *

Our report for the past eleven months, commencing Oct. 1, and ending Aug. 31, making the fiscal year, one month shorter than usual on account of coming here, seems to us to be most favorable. When we consider that throughout the country all branches of industry have been greatly depressed, and wise heads shook solemnly over the grave state of affairs, we are surprised that instead of suffering with others, we have been constantly gaining ground. Twenty-four new divisions have been established, making 258. Our membership was never so large, reaching at the present 16,000, among which number are many young men. This we are glad to see, for, as we know, old heads can't last for ever; the education they will receive in Brotherhood and railroad matters will better fit them to control the brotherhood of the future, which shall, we hope, not only extend from ocean to ocean through the states, but cross seas, making the old world recognize its good influence and feel its power. * *

At present we have two divisions in old Mexico, both in a prosperous condition and promising well for the future. This is something that we had hardly expected to have; but I tell you, brothers, where there is a railroad, there we are a necessity. The fact is being realized and tacitly acknowledged by even railway managers themselves. Florida is the only state in which we have no division, but the indications are that we shall soon have one established there. We have had some trouble during the past year, to be sure, but in every case, excepting the difficulty at Winnipeg, it has been amicably and satisfactorily adjusted, and even there, had the members been less hasty in action, we might have made a settlement satisfactory to all. It is the only instance of the kind in seven years which we have experienced. Of course, a reduction of wages will always follow a general depression in business. At such times only deliberate action is best. Labor and capital cannot afford to war each with the other; such is the relation that neither can stand alone, being useless, each, without the other; and the time is past when labor must crouch in the dust to capital. Its rights are daily being recognized more and more. The question rests with men as to whether or not their employment shall be respected. Some one has said: "Men cannot make, but may ennoble fate by nobly training it." So it is with our labor. * *

Our social meetings are certainly worthy of mention and commendation. Indeed, too much cannot be said in their praise. Such gatherings are useful in many respects. They foster friendship by bringing together those who might never otherwise have met; and it may be, more especially among the younger members of the order, that a look given or a work spoken on such an occasion may influence their whole after life. Perhaps, too, when many years have passed with their joys and sorrows, their lights and shades, some of those who were present may be sitting in other lands and amid other and different scenes, and bridging over seas and time, their memory may call up from the land of long pleasant recollections of friendship formed at such meetings that "will fringe with gold or bring radiant light to bear on the dark clouds or dim mist of declining life." Nobody knows better than the brethren around me the great benefit derived from the social gatherings of the brotherhood. I heartily indorse them, and hope they will become general.

Our *Journal*, through which we are best able to place all matters of importance and interest before members and the world at large, is constantly full of readable and interesting matter pertaining both to brotherhood affairs and outside events. It was thought best to clothe it in new garments, so we designed the new cover in a way which we thought befitting to the subject. Its circulation is larger than ever before, having reached during the past year the number of 15,000, which, as you know, is a great gain. We are sure there are others who should and who will add their names to our list of subscribers. No brotherhood man should be without it. We desire to return our sincere thanks to all who have contributed to its columns, and earnestly invite those who have not yet favored us with contributions from their pen to do so as often as they can. * *

There is nothing of more importance connected with the Brotherhood than its Insurance Association. I do not know that the field of its usefulness can be gone over too often, or that too much can be said to urge the necessity of insurance upon every man.

Our membership has largely increased during the year, which enables us every now and then to pay a claim from the surplus fund. I do not know that we could no better. We had at the close of the last fiscal year, Sept. 30, 1883, 3,320 members. Died during the year, 40; disabled, 4; forfeited, 207; and had on Aug. 31, 1884, 3,984, showing a net nain of 664.

We have paid forty-two claims of $3,000 each, amounting in the aggregate to $126,009, making a grand total of $1,533,169 that we have paid to the heirs of deceased members since it was established 16 years ago, besides disbursing $500,000 to the sick and needy, which went to cheer the hearts and hearths and homes saddened and darkened by he shadow of death, revealing stars of hope and happiness and dispelling the darkness from many a human heart. The mission of the society has been and would always be to alleviate the sufferings, to soften the pillow of distress, to dry the tears of the widow and the orphan and to bring sunshine and joy to many bereaved and saddened homes. Our association is justly strong, because it has strictly complied with the principle upon which it was founded, and because it has dealt honorably with all. We are proud of her record, and, were our good work to come to a summary ending, its remembrance would bring no pang of sorrow. * *

In your deliberations in this convention you will be called upon to exercise your highest qualities, and I trust your judgment, wisdom and discretion during the sessions will result in the most satisfactory administration of the business of the order, so as to reflect credit upon yourselves and meet with favor at the hands of your constituents.

And now, as we gather up facts from the year just closed, on every hand we see improvement, our membership largely increased, and new divisions established, a large circulation for the *Journal*, and a good harvest of funds which shall relieve the sufferings of many an aching heart. Though fortune has been kind, fate has not spared us. We have buried some good and noble brothers since we last met in convention, and we know not how soon others may be called. It behooves us, then, to keeps our lamps trimmed and burning, since we know not the day nor the hour when the bridegroom shall come. If in the dread ordeal of parting with relatives and friends we can see divinity, and can grasp the hand of Providence when crossing the dark waters, then, indeed, shall we be comforted.

In conclusion, I wish to express my gratitude to the various railroad and express companies for courtesies and favors received, also to my associate in office for the valuable assistance rendered me in the discharge of my official duties, and to the brothers in general for their uniform kindness.

Road-masters' Association of America.

(*Continued from page 733.*)

The former discussion having been closed, the next subject brought up for consideration was:

FROGS AND SWITCHES.

Mr. D. H. LOVELL: The Pennsylvania road uses the steel rail frog, the cast frog being out of date. The length of their longest frogs was 15 ft. On their main tracks a spring rail was used, but in the yards a stiff one was preferred. They had in use Nos. 6, 8, 10, 12 and 16. No. 8 was their standard frog. No. 10, being heavier, was used principally on crossings, and No. 15 for high speeds. On their main track a 60-pound rail was used. Their standard switch was the Lorenz, although they have a number of others in use. They have some split switches 18 ft. in length, which have been demonstrated to be perfectly safe, and are cheaper in first cost than the Wharton. They do not use any stub switches. A spring is used with all their split switches, and by means of a thimble attachment either rail can be made rigid at pleasure. On single set-spring for main track the rod is made rigid. No trouble is experienced from snow and ice blockades by their spring rail frogs, whereas with a stiff rail frog the throat is always open and obstructions are almost invited.

Mr. JOHN SLOAN: The Indiana, Bloomington & Western uses the Clarke-Jeffreys split switch. He preferred a spring rail frog. The split switch he thought as good as the Wharton. It would last from six to eight years, and its first cost was not more than one-fifth more than the Wharton.

Mr. JOHN DOYLE: The Detroit, Lansing & Northern uses the Wharton stationary switch on main line. He also uses the spring rail frog and has one in his track which has been there for nine years and is to-day as good as new. Formerly used a doubled spring rail frog, but they wore out in seven or eight years. Never had an accident from a spring-rail frog. Thought a riveted frog would outwear any other kind. The U-piece, however, between the wing rail and the joint was very hard to repair when worn out. He used his frogs for side track after they had been repaired.

Mr. LOVELL asked if it would be considered safe to put a 67-lb. new wing rail on an old frog?

Mr. DOYLE stated that he had known wing rails to break off at the point, but that no accident had resulted. He had no split switch in use.

Mr. SLOAN preferred a switch without the spring. It was not liable to be tampered with. The bolts for their split switches were turned on the lathe in their own shops and generally fitted very tight. Any repairing, however, for the track department was generally slighted in the shop.

Mr. CHAS. MELVILLE: We use the Elliot frog to replace the old frog. The rivets in a riveted crossing break about every three months, in the middle of the frog. He could not assign any reason for it. He preferred the Elliot to the Morden. He had used a key frog for about eight years and it is to-day in first-class condition.

Mr. LOVELL did not think much of a riveted frog and also thought that a key-frog rattled too much.

Mr. MILLS: On the Southern Central we have the Wharton and a few split switches. On other roads in his state they were used with great success. The Lorenz switch was especially commendable. The frogs used in the East differed greatly from those used in the West. He used the Brahan frog and was well satisfied with it. He used a rigid rail frog for yard purposes and a spring rail on track. Wharton switches were well liked but too expensive.

Mr. J. H. PRESTON: The Chicago, Rock Island & Pacific had used cast frogs of different patterns, but finally abandoned them and now has a steel frog which is made in his own shops. It is a rigid frog. Concluded to try a spring frog which he had also made in his own shops, but abandoned them and came back to the rigid steel rail frog which he uses largely to-day. It is a Morden frog and the angle is 1 in 10. The spring rail frog was abandoned not because of its being a spring, but because of improper construction. The switch adopted by him and used for the last three years is the Stewart split switch. The points are 15 ft. long. They have given good satisfaction and he thought it was the most economical switch he had ever used. In putting in a frog he leaves it to easy gauge, particularly at the points. He considered $\frac{1}{16}$ to $\frac{1}{8}$ and sometimes $\frac{1}{4}$ in. an easy gauge. He sets guard rail 2 in., leaving 2 in. clear flange way. The throat of frog is 2 in.

Mr. R. R. HOUGHTON (Wabash, St. Louis & Pacific) reported using the Elliot and cast frogs. The latter has been entirely abandoned. He is about to commence using a spring rail frog, Missouri Pacific pattern, the main rail of which is spring, the other rigid. They are 19 ft. in length and 1 in 11. Principal trouble with the Elliot was faulty support at the point. He finds a little difficulty in putting in his guard rail owing to the difference in car wheel flanges.

Mr. P. J. CALLAHAN (Chicago, Milwaukee & St. Paul): We make our own frogs and crossings, of rigid pattern, made of boiler iron $\frac{3}{4}$ in. thick. He has experienced considerable difficulty by the breaking of rivets caused by the difference of wheel flanges. The flange trouble is partly due to the engine tires being run too long before turning. The groove of the wheel becomes too great and strikes the frog and breaks the bolts. We have five different crossings and a great number of foreign cars with a corresponding variety of wheel flanges. These often loosen guard rails. We use the Whittemore switch invented by our Chief Engineer, Mr. D. J. Whittemore. It is a stub switch and has large and small gears and swings on a half-circle.

Mr. THOMAS ADAMSON: Uses a stationary frog, without any spring. Recommends the Elliot. Has used a spring frog made by his own company, which wore pretty well, but he preferred a stationary frog. If properly made, however, he thought, he might like a spring frog.

Mr. J. TAUBKEN: Had stiff rail frogs, but preferred those with a spring. Uses the Weir, and considers them safe under all circumstances, when properly taken care of. The only objection to a spring frog is where two tracks meet and both of them are main lines. A split switch he believed to be much safer than a stub switch.

Mr. D. COLEMAN: Uses the Wharton as a safety stub switch for the yards. Has used the Morden, Weir and Elliot frog, and prefers the latter. His gauge of track is set a little wide, and he has trouble with broken bolts. Improper gauge of car wheels also tends to this result. They used spring frogs about five years ago, when one broke, and they were all ordered off the track. Has since used a rigid frog, and thought the Ajax possessed all requirements.

Mr. LOVELL: On several divisions of his road where the Wharton was used, there was a very heavy traffic, and the switches behaved admirably. While he personally preferred a split switch still he would not decry the Wharton. The Association ought to to come to some standard in uniformity as regards frogs, especially in some particulars, such as length of frog, distance from point to heel, etc. The standard length of split switch used on his road, the Pennsylvania, was 18 ft., and it has a throw of $3\frac{1}{2}$ in.

Mr. DOYLE preferred a spring frog without a clamp. His road intends adopting split switches.

Mr. J. W. CRAIG: Has used the Brahan frog for the last seven years, and found them always very satisfactory. Has more trouble with his crossings than with his frogs. Did not believe in crossings made on boiler plate. Never had an accident with the Wharton switch.

Mr. J. A. CRIPPEN: Uses various kinds of frogs, stationary, Morden and spring. Favors the latter if properly made. Now uses a split switch which gives good satisfaction. A 1 in 10 frog gives a lead of 75 ft. The throw in his split switches was $4\frac{1}{2}$ inches.

Mr. MCQUISTON: Have had ten years' experience with the Wharton switch and believes that in the long run it is the cheapest. Neglect to clean properly was, he thought, the principal cause of accidents. He has tried almost every kind of frog and now uses an elastic cast steel and iron frog with wood between.

Mr. REED: A theoretical lead was proper. Practical rules were necessary, but should conform to the theoretical.

Mr. LATIMER, in reply to a question, said that a simple rule for finding the lead was to take twice the gauge of the track multiplied by the proportion of the frog.

The discussion on this subject was then adjourned until the next meeting of the Association.

(TO BE CONTINUED.)

The Forth Bridge.

The following is an abstract of a paper by Mr. B. Baker on this subject, read before the British Association at Montreal:

The contract was finally let to Messrs. Tancred, Arrol & Co., Dec. 21, 1882, for £1,600,000, which was within £5,000 of the estimated cost of the work as prepared by Mr. Fowler and myself for Parliamentary purposes.

The total length of viaduct included in this contract is about $1\frac{1}{2}$ miles, and there are:

2	spans of	1,700 ft. each.
2	"	675 "
15	"	168 "
5	"	25 "

Including piers there is thus almost exactly one mile of main spans, and half a mile of viaduct approach. The clear headway under the centre of the bridge is 150 ft. above high water and the highest part of the bridge is 361 ft. above the same datum. Each of the three main piers consists of a group of four cylindrical masonry and concrete piers, 49 ft. in diameter at the top, and from 60 ft. to 70 ft. in diameter at the bottom. The deepest pier is about 70 ft. below low water, and the rise of tide is 18 ft. at ordinary springs. In the piers there are about 120,000 cubic yards of masonry, and in the superstructure about 45,000 tons of steel.

Operations were commenced in January, 1883, so the works have now been some 20 months in progress, and about $850,000 have been expended in plant and temporary works, and $1,000,000 in the permanent works of the bridge. At South Queensferry an area of about 20 acres of ground has been laid out in shops and yards for the manufacture of the 1,700 ft. span steel girders and for other purposes. These shops are in direct communication with the North British Railway, and are connected by an incline and winding engine with a temporary timber viaduct 2,200 ft. in length and 50 ft. in width, extending from the South Queensferry shore to the first of the groups of four cylindrical iron caissons which constitute the lower portions of the main piers of the bridge. At Inch Garvie, stores and offices have been built, and as this is an exposed island in the middle of the Forth, the staging for the pier work is of iron pinned to the rock. Similarly at North Queensferry, on the Fife side of the Forth, stores, offices and iron staging have been erected.

The state of the works at the present time is as follows:

Plant.—The plant includes 14 steam barges, launches and other vessels; 22 steam, 12 hydraulic and 38 hand-power cranes; 28 single and double engines for shop machines, hydraulic work, air-compressing, electric-lighting, pumping and other purposes; also gas furnaces for heating the steel plates, a 2,000-ton hydraulic press for bending them, and planing machines, multiple drills, hydraulic riveters and other specially designed tools too numerous to mention. Having reference to the novelty and magnitude of the work and the amount of preliminary preparations required, it may be considered that fair progress has been made during the past 20 months.

Foundations.—The coffer dam for the south cantilever end pier was necessarily a very substantial structure, being a quarter of a mile from the shore. It measured 126 ft. by 75 ft. over all, and had a double row of whole timber piles, with 4 ft. of puddle between them, and internal struts, chain cable ties, and external raking struts and piles of great strength and solidity. A highly satisfactory bottom on boulder clay of rock-like hardness was found at a depth of 35 ft. below high water. The masonry consists of an Aberdeen granite facing, averaging a little over 2 ft. in thickness, of rock-faced work, backed up with cement concrete or with rubble masonry set in cement, and bonded, about every 12 ft. in height, with courses of large stones carried across the entire area of the piers.

The main piers have given more trouble than was anticipated. On the Fife shore the whinstone rock bottom falls with a rapid slope of about $1\frac{1}{2}$ to 1 to deep water, and it was necessary to step this slope for the masonry. Diamond drills worked from an iron stage were employed for the subaqueous blasting; but the removal of the rock proved a most tedious affair, and a substantial timber and clay coffer-

dam had, after all, to be constructed for one of the piers With some trouble the other pier was built within a make-shift half-tide dam, made up partly of the 60 ft. diameter permanent iron caisson below low water, with a temporary iron caisson attached to it, the whole made tight to the rock as far as might be with concrete and clay filled in between the caisson and a few buckle plates. Tidal work is proverbially slow and worrying; but we determined that, as the rock varied in quality, no foundation should be put in until the bottom had been laid dry. Where speed is required pneumatic appliances generally offer incomparable advantages over cofferdam work on a rock bottom. French contractors generally resort to pneumatic caissons of ordinary type in depths exceeding 15 ft., but have employed, with great advantage, modifications known as the *caisson-batardeau*, the *bateau-plongeur*, etc., in depths as little as 6 ft. The six weeks required to build a pier with the aid of pneumatic appliances may often be taken up in stopping the leaks of a cofferdam or rock bottom. English contractors are not much accustomed to pneumatic appliances, other than an ordinary diving dress, and rarely resort to them. A diving bell with access shaft and air lock was provided and mounted on a traveler complete at the Forth, and compressed air drills were fitted in the working chamber, but no use has hitherto been made of the apparatus.

The lower part of the South Queensferry main pier consists, as already stated, of a group of four pneumatic caissons 70 ft. in diameter. In the contract the option was allowed of sinking open-topped caissons by dredging inside, but, after experiencing the extreme hardness of the boulder clay, we were all agreed that it would be preferable to resort to the pneumatic process. Owing to the slope of the clay the four caissons will be sunk to varying depths, ranging from 68 ft. to 88 ft. below high water. The caissons, which were built on shore, launched and floated into position, are 70 ft. in diameter at the cutting edge, and taper 1 in 46 to facilitate sinking. At 1 ft. above low water, which is the top of the permanent caisson and commencement of the granite-faced masonry, the diameter is 60 ft. A working chamber 7 ft. high is provided at the bottom of the caisson, the roof of which is supported by four strong lattice girders 18 ft. deep, and cross girders 3 ft. deep spaced 4 ft. apart. An internal skin 7 ft. distant from the external skin, and vertical diaphragms, form pockets which can be filled with concrete at any point where, owing to the slope of the ground and the varying hardness of the silt and clay, a heavier pressure is desired to force down the caisson. Three shafts, 3 ft. 6 in. in diameter, with air locks at the top, pipes for admitting water and ejecting silt, and other of the usual appliances, are provided. The air locks for passing out the clay and boulders, as designed by Mr. Arrol and myself, have, instead of the usual hinged doors, two sliding doors like horizontal sluice valves, across the 3 ft. 6 in. shafts, which are worked by little hydraulic rams, or by hand, and are interlocked like railway switches and signals, so that one slide cannot be opened until the other is closed. Mounted on the side of the air lock is a steam engine which, by means of a shaft passing through a stuffing-box in the side of the air lock and a drum inside, winds up the excavated material in skips containing one cubic yard. The operation of hoisting, opening slides and discharging is rapidly performed, so the two locks have a large working capacity. A third air lock, with side doors, ladder and hoist, is also provided for the men. The air compressing plant consists of three engines, with steam and air cylinders 16½ in. in diameter by 24 in. stroke, ample power being furnished by boilers of the locomotive type erected on the staging.

Two deep piers at Inch Garvie, being on a very irregular and sloping rock bottom, have required much consideration. It was finally decided to level a bed roughly with bags of sand, and to float out pneumatic caissons, and excavate the rock until a level bed was cut. These caissons are 70 ft. in diameter at the bottom, and the rock slopes from 14 ft. to 19 ft. in that length, the lowest point being 75 ft. below high water.

Piers.—All of the pneumatic caissons will be filled with concrete up to low-water mark, the mixture being 27 cubic feet of broken whinstone, 7 of sand and 5½ of cement, which together make a full yard of concrete, having a crushing resistance of about 50 tons per square foot.

Above low water the cylindrical piers, which are 49 ft. in diameter at the top, 55 ft. at the bottom and 36 ft. high, consist of the strongest masonry, the hearting being flat-bedded Arbroath stone with both horizontal and vertical bond, and the facing Aberdeen granite, the whole set in two to one cement mortar, and built in the dry within temporary wrought-iron caissons. In the shallow piers where the rock is stepped the masonry is carried down to the rock itself, and wrought-iron hoops 36 in. by 1⅛ in. bind the bases of the piers. At the top of all the piers 18 in. by 1¼ in. hoops, and midway down 10 in. by ⅝-in. hoops are also built in, and it is believed that these cylindrical masses of masonry are as completely monolithic as can be obtained or desired. In each cylindrical pier there are 48 steel bolts 2½ in. in diameter and 24 ft. long to hold down the bed-plates and superstructure of the main spans.

(TO BE CONTINUED.)

The "Rocket."

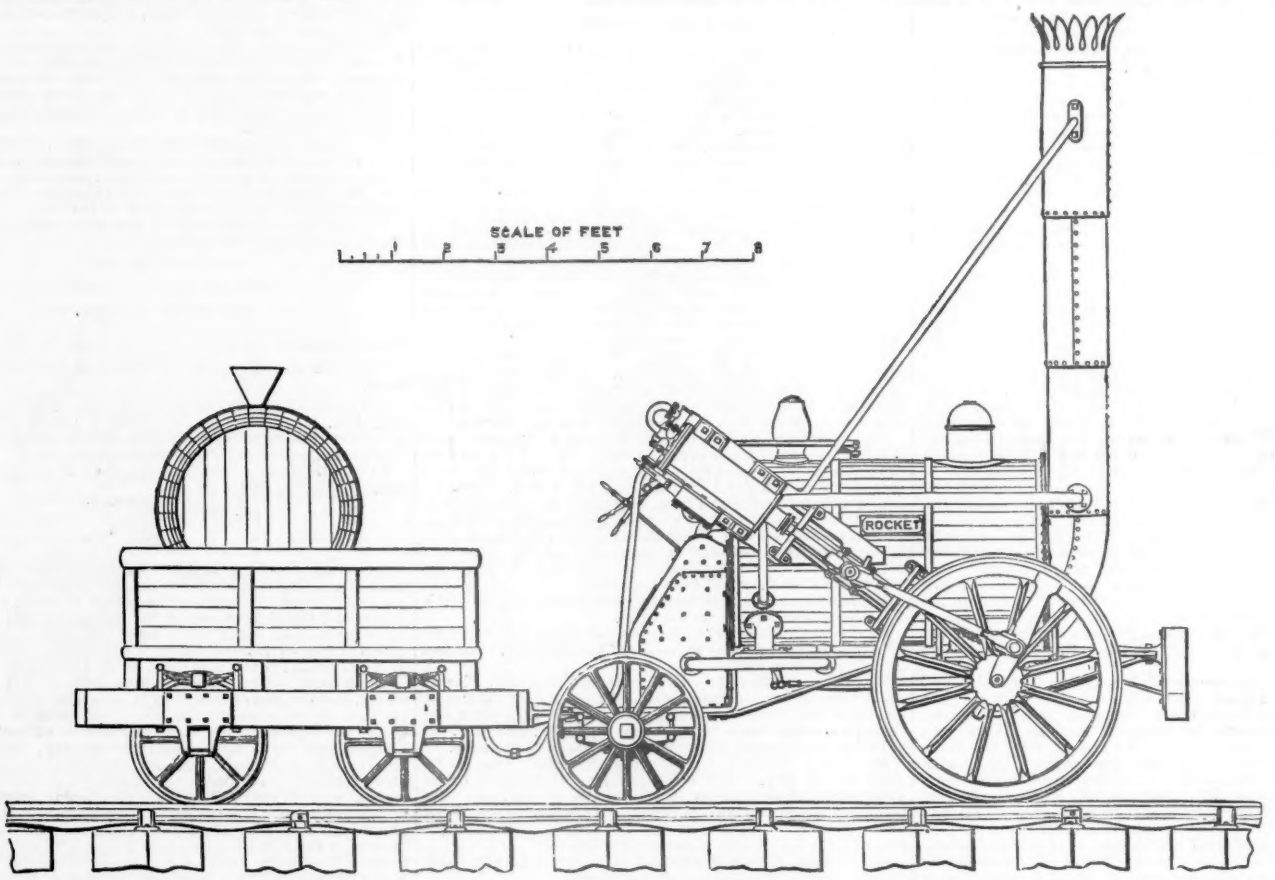
We reproduce from *The Engineer* some interesting particulars, and a drawing never before made public, of perhaps the most widely known locomotive ever built, George Stephenson's "Rocket." It will be seen that in the eleven months' interval between the Rainhill trials and the opening of the Liverpool & Manchester Railway, the locomotive underwent a more considerable development than is generally supposed, and that the "Rocket" of 1830 closely resembled in many essential respects the modern locomotive. The sketch of the "Rocket" in 1830 is doubly interesting as being the work of the inventor of the steam hammer, who sprang from a family of artists, and is, as the sketch shows, no mean artist himself. The *Engineer* says:

"When the Liverpool & Manchester Railway was opened on the 15th of September, 1830, among those present was James Nasmyth, subsequently the inventor of the steam hammer. Mr. Nasmyth was a good freehand draughtsman, and he sketched the 'Rocket' as it stood on the line. The sketch is still in existence, and we have produced, as nearly as possible, this invaluable link in the history of the locomotive. Mr. Nasmyth writes concerning it, July 26, 1884: 'this slight and hasty sketch of the 'Rocket' was made the day before the opening of the Manchester & Liverpool Railway, Sept. 12, 1830. I availed myself of the opportunity of a short pause in the experimental runs with the 'Rocket,' of three or four miles between Liverpool and Rainhill, George Stephenson acting as engine driver, and his son Robert as stoker. The limited time I had for making my sketch prevented me from making a more elaborate one, but such as it is, all the important and characteristic details are given; but the pencil lines, after the lapse of 54 years, have become somewhat indistinct.' The pencil drawing, more than 50 years old, has become so faint that its reproduction has become a difficult task. Enough remains, however, to show very clearly what manner of engine this 'Rocket' was. For the sake of comparison we reproduce an engraving of the 'Rocket' of 1829. A glance will show that an astonishing transformation had taken place in the eleven months which had elapsed between the Rainhill trials and the opening of the Liverpool & Manchester Railway. We may indicate a few of the alterations. In 1829 the cylinders were set at a steep angle; in 1830 they were nearly horizontal. In 1829 the driving-wheels were of wood; in 1830 they were of cast iron. In 1829 there was no smoke-box proper and a towering chimney; in 1830 there was a smoke-box and a comparatively short chimney. In 1829 a cask and a truck constituted the tender; in 1830 there was a neatly designed tender, not very different in style from that still in use on the Great Western broad gauge. All these things may perhaps be termed concomitants, or changes in detail. But there is a radical difference yet to be considered. In 1829 the fire box was a kind of separate chamber tacked on to the back of the barrel of the boiler, and communicating with it by three tubes; one on each side united the water spaces, and one at the top the steam spaces. In 1830 all this had disappeared, and we find in Mr. Nasmyth's sketch a regular fire-box, such as is used to this moment. In one word, the 'Rocket' of 1829 is different from the 'Rocket' of 1830 in almost every conceivable respect; and we are driven perforce to the conclusion that the 'Rocket' of 1829 *never worked at all on the Liverpool & Manchester Railway; the engine of* 1830 *was an entirely new engine.* We see no possible way of escaping from this conclusion. The most that can be said against it is that the engine underwent many alterations. The alterations must, however, have been so numerous that they were tantamount to the construction of a new engine. It is difficult, indeed, to see what part of the old engine could exist in the new one; some plates of the boiler shell might, perhaps, have been retained, but we doubt it. It may, perhaps, disturb some hitherto well-rooted beliefs to say so, but it seems to us indisputable that the 'Rocket' of 1829 and 1830 were totally different engines.

"Our engraving, the 'Rocket,' A. D 1829, is copied from a drawing made by Mr. Phipps, M. I. C. E., who was employed by Messrs. Stephenson to compile a drawing of the 'Rocket' from such drawings and documents as could be found. This gentleman had made the original drawings of the 'Rocket' of 1829, under Messrs. G. & R. Stephenson's direction. Mr. Phipps is quite silent about the history of the engine during the eleven months between the Rainhill trials and the opening of the railway. In this respect he is like every one else. This period is a perfect blank. It is assumed that from Rainhill the engine went back to Messrs. Stephenson's works; but there is nothing on the subject in print, so far as we are aware. * * * * Hitherto it has always been taken for granted that the alteration consisted mainly in reducing the angle at which the cylinders were set. The Nasmyth drawing alters the whole aspect of the question, and we are now left to speculate as to what became of the original 'Rocket.' We are told that after 'it' left the railway it was employed by Lord Dundonald to supply steam to a rotary engine; then it propelled a steamboat; next it drove small machinery in a shop in Manchester; then it was employed in brickyard; eventually it was purchased as a curiosity by Mr. Thompson, of Kirkhouse, near Carlisle, who sent it to Messrs. Stephenson to take care of. With them it remained for years. Then Messrs Stephenson put it into something like its original shape and it went to the South Kensington Patent Museum, where 'it' is now. The question is, what engine is this? Was it the 'Rocket' of 1829 or the 'Rocket' of 1830, or neither? It could not be the last, as will be understood from Mr. Nasmyth's drawing; if we bear in mind that the so-called fire-box on the South Kensington engine is only a sham made of thin sheet iron, without water spaces, while the fire-box shown in Mr. Nasmyth's engine is an integral part of the whole, which could not have been cut off. That is to say, Messrs. Stephenson in getting the engine put in order for the Museum, certainly did not cut off the fire-box shown in Mr. Nasmyth's sketch, and replace it with the sham box now on the boiler.*

"In 'Wood on Railroads,' 2d edition, 1832, page 377, we are told that 'after those experiments'—the Rainhill trials—'were concluded, the Novelty underwent considerable alterations,' and on page 399. 'Mr. Stephenson had also improved the working of the 'Rocket' engine, and by applying the steam more powerfully in the chimney to increase the draught, was enabled to raise a much greater quantity of steam than before.' Nothing is said as to where the new experiments took place, nor their precise date. But it seems that the 'Meteor' and the 'Arrow'—Stephenson engines—were tried at the same time; and this is really the only hint Wood gives as to what was done to the 'Rocket' between Oct. 6, 1829, and Sept. 15, 1830.

"There are men still alive who no doubt could clear up the question at issue, and it is much to be hoped that they will do so. As the matter now stands, it will be seen that we do not so much question that the 'Rocket' in South Kensington Museum is, in part perhaps, the original 'Rocket' of railroad celebrity, as that it ever ran in regular service on the Liverpool & Manchester Railway. Yet, if



THE "ROCKET," A. D. 1829.

*The "Rocket" as it now exists in the South Kensington Museum (England) was illustrated in the *Railroad Gazette* for Aug 18, 1876. The differences between it and the two sketches in this issue are considerable.—EDITOR RAILROAD GAZETTE.

not, then we may ask what became of the 'Rocket' of 1830? It is not at all improbable that the first 'Rocket' was cast on one side, until it was bought by Lord Dundonald, and that its history is set out with fair accuracy above. But the 'Rocket' of the Manchester & Liverpool Railway is hardly less worthy of attention than its immediate predecessor, and concerning it information is needed."

It seems that the Fates have decreed that the origin of almost all great inventions should be enveloped in doubt, for immediately after the above account appeared, a correspondent wrote to *The Engineer* as follows:

"I was at the opening of the Liverpool & Manchester Railway on the 15th of September, 1830, and well recollect seeing the 'Rocket.' There must be some great mistake about the sketch ['Rocket, A. D., 1830']. Your 'Rocket, A. D., 1829,' is as near correct as any man's memory can say. On that day she had most certainly a wooden tender, with a wooden cask on it painted green, to hold the water. The cylinders were diagonal, as shown in that figure, and the chimney and top were the same. The fire-box was as shown in that figure. It is a great pity that such a nice little sketch as you have inserted should be handed down to mislead posterity, as it is certainly a most incorrect representation of what the 'Rocket' was at the opening of the Liverpool & Manchester Railway, and some things glaringly point out there is some mistake. The tender is just such as was introduced by Edwin Bury. The horn plates [pedestals] particularly denote this. The spring balance in this shape was not introduced till years after, neither was the chimney top introduced in that shape until years after; and I am inclined to think that glass water gauge was not in existence; most certainly it was not on the 'Rocket' in the form shown. The oil cup forged solid on the connecting rod strap did not exist. In fact, the cylinders were diagonal. The boiler barrel is shown as if it were lagged with timber. The first introduction of boiler clothing was first a coat of felt; then covered with canvas, and stitched by a sail-maker, and painted green. There must be some fog about. Mr. Nasmyth says he made this sketch at Liverpool on the 12th of September, 1830, whilst the engine was at rest after some experimental trips the day before the opening. How is this? The line was opened on a Wednesday, the 15th of September, 1830, and if Mr. N. made this sketch on the 12th, it must have been made on Sunday. Surely they would not be experimenting on the Sunday. I cannot account for it, but I have for many years thought that the 'Rocket' would be more inquired after some day. * * *

"I well recollect seeing the 'Rocket' come to Oldfield Lane for the doctor to go to Mr. Huskisson, who, it was said, they had left at the rectory at Eccles. The news of the accident to Mr. Huskisson threw a great gloom over the day's proceedings."

The writer of the above appears to be a practical engineer who very distinctly recollects the opening of the line, and the part played in it by the "Rocket," which knocked down and killed Mr. Huskisson. On the other hand, Mr. James Nasmyth has achieved special distinction as an engineer, an inventor, a man of business, an astronomer, and lastly as the writer of a most interesting autobiography, and his sketch made at the time will outweigh any man's memory. Where such authorities differ, who shall venture to decide?

The Philadelphia Electrical Exhibition.

We take the following from the Philadelphia *Ledger*:

The Electrical Exhibition was brought to a successful close on Saturday evening, as far as the admission of the general public is concerned. The examiners will, however, continue their work of testing for several days, and perhaps weeks, and for that purpose the engines will be kept at work, but no one is to be admitted to the building except on business connected with the work of the examiners, or for the removal of exhibits.

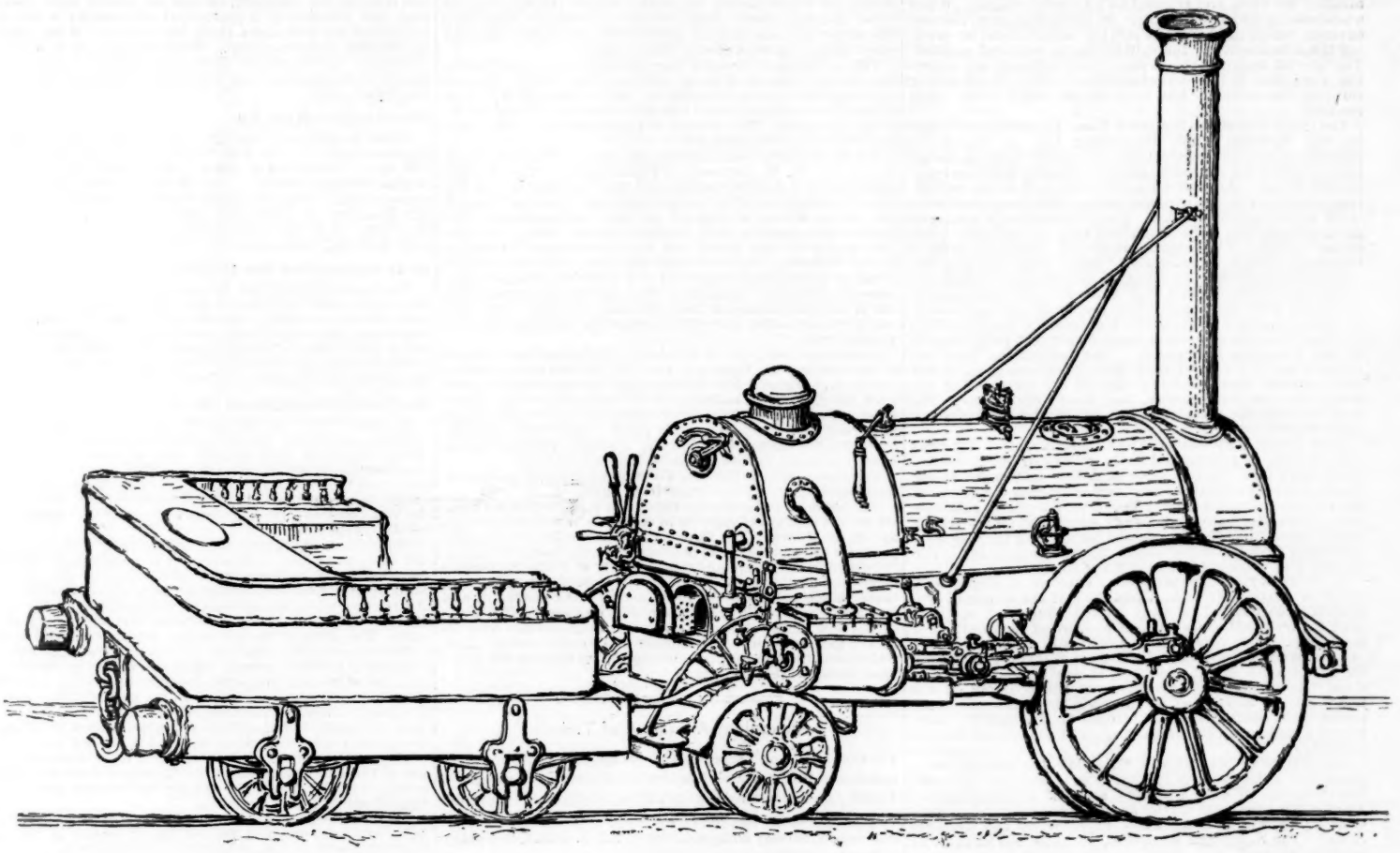
Electric Clocks.—No less than four different systems of electric clocks were represented at the Exhibition, each serving a different purpose. Some of the clocks shown are really electric motors, driven by electricity but governed by the pendulum. Another class, known as time telegraphs, is composed of regulating clocks driven by weights or springs, which transmit their motions to dials by a current of electricity. Another system uses a current of electricity to govern or correct the time of other mechanical clocks from a central regulator; and, finally, a telephone clock is exhibited which transmits to telephone subscribers the exact time by means of sound.

The Spellier system of time telegraphs belongs to the second of these classes. This system, the invention of Mr. Louis H. Spellier, of Philadelphia, consists in the use of a fine astronomical regulating clock placed at a central station, which at regular intervals sends through a circuit a current of electricity which actuates motors attached to dials situated at a distance. A clock actuates a series of three contacts, which transmits the movement to various dials. The circuit breaker or contact apparatus consists of a revolving disk, on the lateral face of which three pins are inserted. These pins in their revolution strike upon lever-springs which close the circuit of which the disk forms a part. As the disk revolves the pin passes at a definite moment from beneath the lever, when, by a simple contrivance, the current is for a moment short circuited, and thus sparking is avoided. If a spark passes across a delicate contact, the effect is to speedily destroy it and prevent the certain passage of the electrical current. Another sparkless current breaker, also the invention of Mr. Spellier, consists of a horizontal bar attached to the side of the pendulum. As the pendulum swings to the right this bar makes a contact with a spring which allows a certain degree of movement without breaking. As the pendulum swings in the contrary direction the spring follows it until it reaches a position where contact is made with another spring which serves to short circuit and ground the residual current. The short circuit is for an exceedingly short space of time, but is sufficient to prevent the slightest spark. The current which operates the dial clocks is furnished by one or more cells of a constant voltaic battery, and the circuit, after leaving the circuit breaker on the regulator, is completed by encircling the armatures of electro-magnets in the distant dials. The armature of any one of these electro-magnets consists of a circular disk of soft iron upon which is formed a series of projections like shallow teeth upon a cog wheel. These teeth approach very near the poles of the electro-magnet in their revolution, and are successively attracted by a magnetic impulse sent through its coils. Attached to this wheel is a second or escapement wheel, consisting of a series of triangular teeth with unequal faces, upon which rests a weighted fulcrum lever with a friction roller resting upon the teeth. When a current of electricity is transmitted through the magnet it attracts the nearest projection to a position opposite its poles, which causes the fulcrum lever to be carried a little beyond the apex of the triangular teeth of the escapement wheel. As soon as the current is broken the weight of the lever causes the friction roller to descend into the notch of the tooth and so cause a forward motion of the ring armature. In this position another projection of the iron ring is brought into the magnetic field to be attracted when the circuit is again closed.

In the older systems of time telegraphs the armature is attracted to the magnet by a hammer-like movement, and where small divisions of time are marked the rapid blows, besides being disagreeable on account of the noise they make, tend to injure the machine and destroy its accuracy. By the use of a series of revolving armatures, which revolve freely in front of the poles, all noise and percussive effects are avoided in the Spellier system, and the combined use of magnetic and mechanical means for securing the movement reduces the cost of battery power. At the exhibition three large dials were shown operated by a single cell. There were also many dials scattered about the building controlled and operated by the single regulating clock. For this system of time telegraphs Mr. Spellier received the Elliot Cresson Gold Medal from the Franklin Institute.

In the electric railroad clocks exhibited by Trippen Brothers, of Philadelphia, contacts are made upon either side of the swinging pendulum alternately. Each contact piece connects with a separate electro-magnet, which are arranged opposite and parallel with each other. The armatures are composed of small pieces of soft iron united by a balanced yoke. This yoke is prolonged at either extremity and ends in two small projections, which enter the teeth of escape cog-wheels. Two of these wheels are arranged on the same shaft, so that when this projection is in the interval of the cog-teeth of one wheel the other wheel presents the lateral face of the other wheel to the other projection. When contact is made the current flows about one of the electro-magnets, attracts its armature, and draws the projection on one side of the yoke down into the interval of the cog on that side, at the same time releasing the cog wheel upon the opposite side. When contact is made upon the other side it draws down its armature on its side, and these alternate movements each advance the cogs one tooth. The wheels are geared into the ordinary clock movement and move the hands at the rate of one second at each beat of the pendulum.

Willy Wallach, of New York, exhibits the Grau system of electric clocks. A regulating clock releases a movement at the expiration of each minute, which causes a rotating contact to connect with a series of contact plates, each of which is connected with a series of secondary clocks. The secondary clocks consist of a permanent magnet, whose armature is formed of two rotating electro-magnets which receive the electric current. When contact is made one of the electro-magnets, which are arranged upon the same axis at right angles with each other, is charged, and the similar poles respectively of the electro-magnets and of the permanent one, mutually repelling each other whilst the contrary poles attract, a movement is caused by which the charged electro-magnets are placed at right angles with the poles of the permanent magnets. In this position they lose their magnetism, and are held by the attraction of the permanent magnet. The next time contact is made the current flows through the other electro-magnet which is similarly rotated on its axis. The rotating armature is connected by suitable gearing to the hands of the clock, and the movement of ninety degrees is thus made to cause an advance of the hands of one minute.



This Sketch of "The Rocket" I made at Liverpool on the 12 Sept 1830 the day before the Opening of the Liverpool and Manchester Railway while it remained Stationary after some Experimental Trips in which George Stephenson acted as Engine Driver and his Son Robert as Stoker

James Nasmyth

THE "ROCKET," A. D. 1830.

The Time Telegraph Co. of New York, use electricity as the motive power of the regulating clock, and thus dispense with weights or springs. The movement of the clock is regulated by a delicately balanced and accurate seconds pendulum such as is used in astronomical weight clocks. In weight clocks the motion of the pendulum is kept up by the slight push given at each swing of the pendulum by an escapement wheel. In the electric clock the electricity is used to maintain the movements by a very delicate and beautiful contrivance. As the pendulum swings to one side the current is momentarily closed upon the opposite side. An electric magnet is thus put in action which draws down an armature and allows a spring, which is compressed by the swing of the pendulum, to act a little longer than the period required to raise it. This slight added impulse at every beat is sufficient to maintain the movement of the pendulum, and at the same time the contacts so made transmit the electric impulse to the secondary clocks placed in the circuit. The secondary clocks consist of an electro-magnet whose armature rests upon a toothed rod working in a ratchet wheel. At each impulse the tooth draws the wheel forward to a definite extent, where it is held by a second tooth. This second tooth prevents at the same time a greater revolution than one tooth of the ratchet. The regulating clock shown is thus governing the movement of the large number of dials shown by this company in the exhibition.

The Kettel Clock Regulating Co. show a system intended to correct at regular intervals the clocks upon the line of telegraph by the movement of a standard clock. These corrections may be at any desired time preferably made each hour. The attachment is made upon any form of spring or weight clock, and consists of an attachment upon the spindle of the minute hand, and a cam arrangement agitated by the clock and released by an electro-magnet. When an impulse is sent over the line an electro-magnet releases the cam, which mechanically sets the minute hand by pressing the attachment to the spindle in the required position. The special design of the system is for railroad use where the regulator in the superintendent's office could adjust through the ordinary line wire all the office clocks upon the line.

The Oram Telephone Standard Time Repeater, exhibited by the National Time Regulating Co. of Boston, is intended to give every telephone subscriber in an exchange the opportunity to procure standard time by which to regulate his clocks. An instrument is attached to the switchboard at the exchange communicating with the ground-wire of all the telegraph circuits. A circuit-breaker is arranged upon a regulating clock connected with an ordinary open circuit relay. This circuit-breaker is connected with a vibrating contact, which sends a "buzz" over the line at the end of every minute. In addition to this, the clock movement throws into action a small electro-motor which carries a cylinder with projections like the teeth of a music-box. Projecting against this cylinder is a balanced tongue, which is tripped as each projection passes it, giving a peculiar click in the telephone instrument. The projections upon the cylinder are so arranged that these clicks are given in the same manner that fire-alarm signals are struck, first the hour, then the ten minutes, and finally the minute. The buzz indicates the exact second at which the minute previously struck occurs.

Time Locks, Watchman's Time Detectors, etc.—The time lock for safes is represented in the gallery of W. E. Pierce, of Philadelphia. In this time lock the movement of the hands makes an electric contact which releases the bolts of the safe and allows them to respond to the proper combination. Two clocks are used, one of which may be set to any desired hour, the other being used for opening the safe at a particular hour if the first should become inoperative. The battery and wires are included inside the safe.

J. S. Bailey, of Pennsylvania, exhibits a dispatching clock for use on railroads. Upon the dial are arranged concentric rings, divided into any desired number of sections, with the intervals so arranged as to allow of the insertion of small pins. These pins serve to electrically connect with the minute hand of the clock. As contact is made a gong may be struck or a signal displayed at any desired minute of time. By an automatic arrangement the contacts on the hand may be shifted so as to reach the pins set upon the inside of the concentric rings, instead of the outside. This allows a change of time of starting on Sundays from that on other days.

The American watchman's time detector consists of a paper dial ruled radially for the hours, which is revolved like the hands of a clock before a series of electro-magnets. Each of these magnets carries an armature provided with a steel stylus, which indents the paper when the circuit is closed. The watchman is required to close the circuits at regular intervals, and from suitably placed boxes on his route. The dial is locked up in the superintendent's office, and reveals on the following morning any neglect.

The Electrical Supply Co. exhibits a watchman's time detector, in which a series of circuit closers are connected with a dial upon which a mark is made. The clock movement gradually shifts the position of the indenting needle so as to serve for an entire week instead of for a single night.

The Western Electric Co. exhibits another clock which registers upon a dial not only the time but also the position of the box by the number of the indentations made upon the sheet.

Electric Motors.—A modern electric motor is practically a dynamo machine reversed, or in which a current of electricity passed into the coils of the armature of a magnet causes the armature to revolve with the evolution of energy. Any dynamo which generates greater electromotive force than would be consumed in its own inertia will act as a motor. Indeed, several of the machines exhibited serve either as dynamos or as motors.

Two English motors are shown. That designed by Sylvanus Thompson attracts considerable attention from its distinguished inventor's name. The Electrical Supply Co. of New York exhibit the Ayrton & Perry motor, which consists of an outside ring wound as is the Gramme ring armature, within which revolves a magnet which is also wound.

The United States Electric Lighting Co. exhibit two of the Weston motors of 3 horse-power each in action. One is operating a pump lifting 200 gallons of water per minute. The other is driving the machinery exhibited by William Sellers & Sons, and driving the mechanical air-pump used to produce a partial vacuum in their incandescent globes. The Weston motor does not differ in construction from the Weston dynamo in any particular.

The Brush Electric Co. has three motors, one of one horse-power, the other two rated at three horse-power each.

The Edison Co. exhibited a 300-light dynamo machine.

The Rockenzaun Motor, manufactured by the Electrical Power Storage Co. of London, is exhibited in the gallery. It consists of a double magnet, between whose poles revolves a Gramme ring armature. Its total weight is stated to be only 106 pounds, and its power to be about one and one-half horse. It is intended especially for electrical locomotives.

F. G. Sprague exhibits his self-governing dynamo machines, whose action is certainly remarkable. They are supplied with current from the Edison machines, and are used for driving various machines, including looms, fans and drilling and planing machines. The looms are shown doing practical work, and attached to one of the machines driving a loom is a speed register. When the loom is started there is scarcely a perceptible variation in the speed of the motor, and no more effect occurs when the belt is thrown off. The method by which this self-governing is accomplished is not made public, the inventor not having yet secured all his patents. Six machines are shown, three are one-and-a-half horse-power, and three others, varying in power, from three to one horse.

The Daft motor is shown driving the printing press upon which the *Electrical World* is printed. It is supplied with electricity by the Daft dynamos situated in the gallery.

Electric Railways.—The proposition to run street and other railways by electricity was made many years ago, and has been put into experimental use on several occasions.

The Bidwell Electric Railway has been running successfully in the annex over a short experimental line. The Bidwell system includes the motive power, lighting by arc and incandescent lamps, and using electricity along the line for other purposes. It consists essentially of a means of conducting the electricity so as to prevent loss, as far as possible, from the various causes which interfere with the current supplied to street cars. The electrical conductor of the Bidwell system is a tube split longitudinally, and held in position, slit downwards, by insulated supports from the side of the track. From the bottom of the car projects a bent iron bar, upon the extremity of which is carried a wheel whose diameter is greater than twice the diameter of the tube. This wheel projects upward through the slit in the tube so as to form a contact with the inner side of the upper part of the tube. The current is thus carried to a motor of any desired character which, acting upon the wheels through belts or other gearing, gives motion to the car. Besides supplying the motor the same current supplies five arc lights and the car is lighted up with eleven Edison lamps.

The advantages claimed for this method of conducting the current is that it is snow, rain and dirt-proof. The bar carrying the wheel is intended to project through a slot, as in the cable railway, and thus the conductor would be entirely protected. The system is the invention of Mr. Benson Bidwell, of Philadelphia.

An electric street car exhibited in motion was the invention of Mr. W. W. Griscom, of Philadelphia. The current is carried by a third or middle rail, and is returned to the motor through one of the outside rails after passing through the motor which is situated on the front platform. The method of connection is by brushes rubbing along the rails. The motor of this street car is a 15 horse-power Griscom motor, differing, however, from the other Griscom motors in using an armature composed of a modified Gramme ring, instead of Siemens' armature. The current is derived from the Weston incandescent lamp dynamo machine. The test was very successful, the machine starting, stopping and reversing easily.

Lightning Rods.—F. O. Goodwin, of Philadelphia, makes a fine display of lightning rods of his own manufacture, points and vanes. His twenty-eight strand cable is used upon the Exhibition building for its protection from lightning. He also exhibits a screw connection for copper lightning rods and Prof. Houston's point. This point consists only of a five-branched point, the separate portions being heavy, so as not to fuse in case of lightning strokes.

The Rhode Island Electric Co. exhibits its system of rodding buildings to protect them from lightning.

The *Siemens Regenerative Gas-burner*, although not electrical, yet is of great interest in comparison with the electric arc lights shown. The Siemens system consists in using the products of combustion to heat the gas and the air before it is burned in the lamp, and in the supply of a due proportion of air and gas for perfect combustion in the burner. Six of these lamps are used for illuminating the restaurant, and two are shown to illustrate the system of street lights. Each of the six lamps shown is guaranteed not to burn over 50 feet of gas per hour, and to supply 500 candle power. It is stated that the consumption during the Exhibition has averaged about 46 feet per hour.

Fraudulent Alteration of Tickets.

The Committee on Skeleton Tickets appointed at the recent meeting of the National Association of General Passenger & Ticket Agents (Messrs. Lucius Tuttle, George L. Connor and S. W. Cummings) has made the following report, which is sent out to railway companies by Mr. A. J. Smith, Secretary of the Association:

The Committee appointed by the National Association of General Passenger & Ticket Agents to consider the question of alteration of passage tickets by chemicals, beg to report as follows:

The fact that all kinds of common writing inks can be bleached or removed by chemicals without injury to the paper used has long been known to chemists, but it is only within the past two years that the fact has been made use of to any great extent, in the common affairs of business. At present nearly every stationer can supply, at a trifling cost, an erasive compound that will completely remove the ordinary writing inks from railroad tickets, checks, etc., leaving no evidence of the erasure.

By the use of these compounds evil disposed persons can remove the written destination, or any other written portion of a passage ticket, and substitute new matter at their pleasure.

Your Committee has secured and tested several samples of the following standard inks in common use: "Stafford's Blue Black," "Stafford's Commercial," "Stephen's Blue Black," "Arnold's Writing Fluid," "Maynard & Noyes' Black," "Carter's Raven Black," "Thaddeus Davids & Co.'s Steel Pen Ink," "Antonie's Violette Noire," and "Carter's Carmine."

Upon the application of erasive compounds at hand, matter written with each of the above samples of ink was completely removed from tickets and from ordinary writing paper without leaving any evidence of the alteration, and the paper was left in perfect condition to admit of a second, or even a third, writing without detection.

In our investigation we were assisted by a chemist of recognized ability, who stated that all ordinary inks of whatever color could readily be discharged from paper by the use of well-known chemicals, accessible to all.

It should here be stated that while ordinary ink was easily removed from "safety paper," the paper was so discolored as to leave the alteration apparent.

After fully demonstrating that the inks above-mentioned were capable of perfect removal with chemicals, your Committee subjected to similar and exhaustive tests, assisted by the chemist, a newly invented writing fluid known as the "Kosmian Safety Ink," and in none of the tests was it found possible to bleach or remove the writing in the slightest degree.

During the investigation your Committee examined the original of a series of tests made by John M. Ordway, Professor of Chemistry, Massachusetts Institute of Technology, covering writings made with ten different inks, one of which was the aforesaid Kosmian safety ink.

The writings had been subjected, during a period of six weeks, to the most severe tests known in chemistry.

In the sample sheet referred to all the inks except Kosmian safety were absolutely removed from the paper while the Kosmian safety ink remained apparently unaltered.

After the investigation detailed above, which your Committee have endeavored to make as complete and full as possible, we unhesitatingly recommend the use of the Kosmian safety ink by all railroad companies in filling out skeleton tickets, orders, etc., that are liable to alteration after issue.

In reaching this conclusion, your Committee is not unmindful of the delicacy of recommending for use a special invention, and in doing so we are governed only by what we believe to be our duty to a common interest in endeavoring to protect railroad companies from forgery and fraud in tickets.

THE SCRAP HEAP.

The Susceptible Car-Coupler.

A correspondent writes us that at the tests before the Massachusetts Commissioners his coupler didn't do quite as well as it generally does owing to the presence of a "Dolly Varden" on the tender. As usual, there is a woman at the bottom of it. Whose Dolly Varden was she—the engineer's or the fireman's? or did she distribute her smiles impartially between them, and break the heart of any good-looking car-coupler man into the bargain? We think our correspondent has fully explained the erratic behavior of his coupling, though we should have thought that the presence of a pretty girl on a tender would have distracted the man more than the coupler. What luxuries the modern runner enjoys! When we fired to honest John Woodgate on No. 65, we never had a Dolly Varden on the tender to shorten the long hours when we were running the Holloway coal!

Business Looking up.

A pretty good joke was got off by Mr. John Headden, Superintendent of the Rogers Locomotive Works, a day or two ago. An agent for some kind of supplies was in the works soliciting orders. Mr. Headden gave him some encouragement, when the agent cheerfully exclaimed, "Well, Mr. Headden, so business is looking up." "Yes," said Mr. H., "it is. It is flat on its back and can't look any other way than up."—*Paterson (N. J.) Press.*

Snaring Deer on the Railroad.

The hands on one of the Marquette & Western ore trains discovered a deer fast in the wire fence along the right-of-way, one day recently, and they very quietly took him in. His horns were fouled in the wires in such a manner that he never could have released himself. He made just as good venison as though "Hawkeye" had shot him on the run.—*Marquette (Mich.) Mining Journal.*

Railroad Employes in Mexico.

Complaints are very frequently made in the press that the railway companies are not complying with the terms of their concessions that require that at least two-thirds of their employés shall be Mexicans. This, however, is manifestly not the case, for the inquiries often made by the government in response to these complaints have shown that the requisite proportion of native employés is maintained by the companies.

The general impression that the railway companies are not doing their duty in this respect probably comes from the fact that in the upper grades of service on the railways built by American capital the places are nearly all filled by Americans, while the balance is maintained by the great army of common laborers, composed principally of Mexicans. The letter of the law is thus strictly complied with.

The necessity for employés of thorough training and experience is nowhere greater than on railways, where the security of life and property depends upon the absolutely faithful performance of duty. In the nature of the case, in a country where railways are of such recent date as here in Mexico, employés filling these requisites cannot be obtained to anywhere near the extent demanded among the natives of the country, and therefore recourse must necessarily be had to the United States, where the vast system of railways spread over all parts of the country has made a multitude of trained railway men available.

All this, however, will change in the course of time, and those who have watched the course of events in the past four years will see that it has changed already to a notable extent. The number of Mexicans in all grades and branches of railway service will be found to be large, in comparison with the few who occupied positions of trust in the first few months of the American railway enterprises in this country. Scarcely a department will be found in which Mexicans are not occupying responsible positions.—*Mexican Financier, Oct. 4.*

A Wonderful Jump.

"I tell you what, boys, I've railroaded it for years and been mixed up in all kinds of disasters, but I hope to croake right here if I want to be the eye-witness again of such an awful sight as I saw a day or two ago."

The speaker was a brakeman on the Erie.

"A day or so ago," he continued, "a tall and handsome woman got into the ladies' car at Dunkirk. With her was a bright and interesting boy, possibly two years of age. The child laughed, and croaked, and played with the passengers. When the train left Cattaraugus the woman, who seemed nervous, got out of her seat, picked up the baby, and started for the rear end of the coach.

"A short distance east of Cattaraugus is a long deep gulf, over which the railroad has built a high trestle. The distance from the top of the trestle to the wagon road below is perhaps 100 ft. A sharp and short curve leads to the trestle. As the train rushed over the gulf a woman's piercing shriek was heard. I looked and saw an object leap from the platform into the rocky gulf. That object, sir, was the lady passenger, and in her arms closely clasped to her breast was her infant. I pulled the bell-cord and the train came to a halt. How it happened I cannot say, but at the time the woman jumped a load of hay, drawn by a pair of oxen, passed under the trestle. Mother and child landed squarely in the centre of the hay, and were thus saved from a horrible death. The farmer was so horrified that he jumped from his wagon and darted up the hill. The woman, who was not hurt in the least, said her name was Mrs. Adam Scell and her home in Michigan. She was on her way to visit friends in the oil country. Hers was indeed a miraculous escape."

Mrs. Scell said that she could not explain her action. When near the car door she was seized with an insane desire to jump from the train.

The farmer as he drove along was thinking of his dead wife and daughter. When the visitors came through the clouds, as it were, and landed on his hay, he thought that the dear departed had come back to earth to revisit him.—*Bradford (Pa.) Letter in Philadelphia Times.*

ANNUAL REPORTS.

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Western Union Telegraph Co.

At the close of the last fiscal year, June 30, 1884, this company had in operation 145,037 miles of telegraph lines, 450,571 miles of wire and 13,761 offices; an increase during the year of 743 miles of line, 17,845 miles of wire and 844 offices.

Besides this property it owns a large amount in stocks of other telegraph and telephone companies which it controls, and some of whose lines it leases.

The stock and debt at the close of the year were as follows:

Stock	$80,000,000
Bonds	7,214,456
Total	$87,214,456

Of the stock the company has $20,669 in its treasury. The bonds include $921,456 in 6 per cent. bonds, due in 1900; $4,920,000 in 7 per cent. bonds, due in 1900, and $1,373,000 in 7 per cent. bonds, due in 1902. The interest charge is $495,797 yearly.

The stock and bonds are as follows:

	Stock.	Bonds.	Total.
Per mile of line	$552	$50	$602
Per mile of wire	178	16	194

During the year the bonded debt was increased by the issue of $1,000,000 of the 7 per cent. bonds of 1900. There is $290,163 in the sinking fund.

The earnings for the year were as follows:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Earnings	$19,632,940	$19,454,903	I. $178,037	0.9
Expenses	13,022,504	11,794,553	I. 1,227,951	10.4
Net earnings	$6,610,436	$7,660,350	D. $1,049,914	13.2
Per cent. of exps.	66.33	60.62	I. 5.71	

The expenses were made up last year of the following items:

Operating and general expenses	$9,278,761
Rental of leased lines	1,842,690
Maintenance and reconstruction	1,350,448
Taxes	301,077
Equipment of offices and wires	249,528
Total	$13,022,504

The expenses last year showed a large increase over those of the preceding year.

The number of messages sent and the average results were as follows:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Messages	42,076,226	40,581,177	I. 1,495,049	3.3
Av. receipt per message	44.28 cts.	47.94 cts.	D. 3.66 cts.	7.7
Av. cost	30.95 "	29.06 "	I. 1.89 "	6.5
Av. net	13.33 cts.	18.88 cts.	D. 5.55 cts.	29.4

The disposition of the net earnings for the year was as follows:

Net earnings, as above		$6,610,436
Interest on bonds	$472,350	
Sinking funds	39,991	
Dividends, 7 per cent	5,599,180	
		6,111,521
Balance, surplus for the year		$498,915
Surplus, July 1, 1883		3,658,554
Surplus, June 30, 1884		$4,157,469

In the 18 years ending June 30 last the total surplus has been $21,082,288. This has been invested in new lines, patents, securities of other companies and other additions to the property.

The report says: "A classification of the expenditures is added to the usual statement, showing that all expenditures for reconstruction and repairs, rentals of leased lines, taxes, and the cost of all equipments, including those of new offices, have been charged, as usual, to current expenses before profits are ascertained. In reconstruction, larger and longer poles, capable of carrying more wires, are always used, adding materially to the original value of the plant. The cost value of the betterments of the lines, as well as the cost of instruments, batteries and furniture for the equipment of new offices, might properly be charged to account of new property; but such has never been the practice of the company. Thus, the value of the plant is constantly being increased, the cost of such increased value being charged to current expenses. The gross earnings of the company show an increase over the previous year of a little more than $178,000, while the expenditures show a larger increase, owing greatly to the extraordinary expenses incurred in maintaining and operating the lines during the strike in July and August, 1883, the first two months of the fiscal year. How much the strike cost the company, in loss of revenue, can only be estimated; but its cost in extraordinary expenses was nearly, if not quite, $500,000. It is believed that, but for the interruptions to business and the extraordinary expenses occasioned by the strike, the gross revenues would have been over $20,000,000, and the net profits above $7,500,000. * * * *

"Of the surplus, June 30, 1884, $4,693,495 have been advanced to the account of construction and investments in real estate and other new property, besides the proceeds of $1,000,000 of bonds sold and applied to that account, and not otherwise appearing in the accounts of the company.

"It has been resolved, that from and after Oct. 1, 1881, expenditures for the construction and purchase of new lines, and other additions to the plant, should be provided for by the sale of assets in the treasury, thus converting one valuable asset into another, considered to be more valuable and more directly in the line of the business of the company, and leaving all the net revenues above fixed charges available for dividends. But this has not been done. The sale of some of our stock in telephone companies was contemplated, but the price offered was so disproportionate to the dividends which they were earning, that no sales have been made. The company, having a considerable surplus above its dividends and fixed charges, has continued to advance the requisite funds for construction and the purchase of new property. These advances are regarded as a constructive loan, which may be recouped to the treasury for dividends whenever the original order may be satisfactorily carried out by the sale of the securities at what may be deemed a fair valuation. * * * *

"Deducting from the gross revenues the earnings of the Atlantic and Cuba cables, the Gold & Stock commercial news and quotation earnings, the dividends received on stocks in other companies, and from other sources than tolls on messages transmitted over the land lines; and eliminating from the gross expenses the rentals paid for ocean cables and for the Gold & Stock Co., and the cost of operating these properties, the average rate collected per message was 36¼ cents, against 38 cents collected during the previous year, while the average cost of transmission and delivery was a fraction over 25 cents per message, being about the same as for the year previous. But the average cost was increased by the extraordinary cost of conducting a limited amount of business during the existence of the strike.

"The cost of handling messages varies greatly according to the number of relays in transmission and the distance and inconveniences of delivery. On direct lines within one circuit, and especially between exchanges or boards of trade, messages can be handled at a very low cost. The cost of the service in transmitting a message from a branch office in New York to a point on a branch line in the interior of New York or New Jersey, is greater than that of sending a message over a direct circuit of 1,000 miles. It also depends on the amount of business. A large volume of business enables us to economize the time of receivers, operators and messengers by constant employment. Hence the very low rates established between boards of trade and between some of the large commercial centres pay some profit; while those rates could not generally be afforded.

"It continues to be the general policy of the company to make conservative reductions of rates; and such reductions always result in an increase of revenue within three or four months after they are made. Even the radical reductions stimulated by competition have produced an increase of revenue at many large offices. * * * *

"It is confidently believed by the management that we shall be able to maintain our revenues for the ensuing year, and that with a material reduction of expenses, yielding a handsome increase of net profits.

"Nevertheless, in view of the continuing necessity of extending lines and adding wires to meet the growing demand for leased wires; and especially in view of the probable forced sale of a considerable amount of telegraph properties which may be purchased for much less than the cost of its production, it is recommended that dividends be hereafter confined to the rate of 6 per cent. per annum, and a cash surplus accumulated in the treasury."

Cincinnati, Indianapolis St. Louis & Chicago.

At the close of its last fiscal year, June 30, 1884, this company operated the following lines, owning them either directly or through ownership of stock:

	Miles.
Main line, Cincinnati to LaFayette, Ind	173.5
Lawrenceburg Branch	2.5
Cin., LaFayette & Chi., LaFayette to Kankakee, Ill.	75.5
Harrison Branch	7.5
Fairland, Franklin & Martinsville	38.5
Vernon, Greensburg & Rushville	44.5
Total	342.0

The company also controls the Kankakee & Seneca, 42 miles, and the Columbus, Hope & Greensburg (completed last year) 27 miles, but those roads are not included in the report. Its through trains run from Kankakee to Chicago on the Illinois Central tracks.

The equipment consists of 75 locomotives; 54 passenger, 3 parlor, 7 chair, 8 postal and 16 baggage cars; 1,926 box, 137 stock, 160 coal, 762 flat, 10 baggage and 35 caboose cars; 2 camp and 4 tool cars. One chair and two passenger cars were added last year.

The general account is as follows, condensed:

Stock		$7,000,000 00
Funded debt		7,454,500.00
Bills payable and call loans		469,218.58
Other accounts and balances		378,449.26
Profit and loss		625,347.84
Total		$15,927,515.68
Road and equipment	$13,685,849.68	
Big Four grain elevator	212,611.30	
Securities owned by company	1,321,214.98	
Central Passenger station account	60,112.60	
Advances to branch lines	321,288.48	
Materials	92,194.81	
Accounts and balances	200,089.99	
Cash	34,153.84	
		15,927,515.68

Stock was not changed during the year. The funded debt decreased $34,150. It consists of $1,599,000 Indianapolis & Cincinnati 7 per cents.; $499,000 Cincinnati & Indiana firsts, $1,329,000 seconds and $33,500 funded coupons; $2,790,000 Indianapolis, Cincinnati & LaFayette 7 per cents.; $1,202,000 general mortgage 6 per cents, and $2,000 old equipment bonds matured, but not presented for payment. The yearly interest charge is $559,655.

The general mortgage is for $7,500,000, the trustees holding $6,298,000 to provide for prior bonds.

The company is also liable for the payment of 7 per cent. yearly on $1,120,000 Cincinnati, LaFayette & Chicago bonds, $450,000 Vernon, Greensburg & Rushville bonds and $73,400 Harrison Branch stock, these charges being $115,038 yearly.

The traffic for the year was as follows:

Train miles:	1883-4.	1882-83.	Inc. or Dec.	P.c.
Passenger	880,085	804,260	I. 75,825	9.4
Freight	732,069	698,136	I. 33,933	4.9
Service	133,416	108,654	I. 24,762	22.7
Total	1,745,570	1,611,050	I. 134,520	8.3
Pass. car miles	4,227,217	3,764,612	I. 462,605	12.3
Freight car miles	17,384,608	17,218,014	I. 166,594	0.9
Passengers carried	915,721	918,927	D. 3,206	0.3
Passenger-miles	35,808,500	35,997,821	D. 189,321	0.5
Tons freight carried	1,230,393	1,221,775	I. 17,618	1.4
Ton-miles	139,936,623	129,853,902	I. 10,082,721	7.8
Av. train load:				
Passengers, No.	41	45	D. 4	8.9
Freight, tons	191	186	I. 5	2.7
Av. receipt:				
Per passenger-mile	2.32 cts.	2.38 cts.	D. 0.06 ct.	2.5
Per ton-mile	1.09 "	1.21 "	D. 0.12 "	9.9

The average passenger journey last year was 39.1 miles; the average freight haul was 112.1 miles. Through passenger trains earned an average of $1.26; commutation trains, $0.61; branch trains, $0.52; freight trains, $2.25 per mile run.

The decrease in the average freight rate was largely due to an increase in through freights and a falling off in local business, due to short crops on the line.

The earnings for the year were as follows:

	1883-84.	1882-83.	Inc. or Dec.	P.c.
Freight	$1,439,548	$1,558,569	D. $119,021	7.6
Passengers	833,066	832,092	I. 974	0.1
Mail, etc.	141,686	151,119	D. 9,433	6.2
Total	$2,414,300	$2,541,780	D. $127,480	5.0
Expenses	1,595,399	1,643,805	D. 48,406	3.0
Net earnings	$818,901	$897,975	D. $79,074	8.8
Gross earn. p. mile	7,059	7,432	D. 373	5.0
Net earn. p. mile	2,394	2,626	D. 232	8.8
P. c. of exps.	66.08	64.67	I. 1.41	...

Taxes are included in expenses, amounting to $52,314 last year and $53,800 in the preceding year.

During the year 20.3 miles of track were laid with 67-lbs. steel rails and 114,962 new ties were used. The lighter steel taken up was used to replace iron on the branches. There were three new bridges built, and 9,348 ft. new sidings laid.

The income account is as follows:

Net earnings, as above		$818,900.56
Rents, etc		62,182.01
Col., Hope & Greensburg earnings, 2 months		2,607.82
Kankakee & Seneca bond interest		19,500.00
Total		$903,190.39
Interest paid and matured	$629,065.62	
Old claims	2,421.90	
		631,487.52
Balance, surplus for the year		$271,702.87
Surplus, July 1, 1883		353,644.97
Total surplus, June 30, 1884		$625,347.84

The road was damaged by the great flood in Cincinnati in February. This flood, however, like that of the preceding year, was so exceptional that it has not been considered necessary to go to any expense for raising the tracks above their present level.

The Columbus, Hope & Greensburg road was completed in May last. This company holds all the bonds, $275,000, and $150,000 (60 per cent.) of the stock, received in payment of advances made to build the road.

The report says: "The passenger station at Cincinnati has been completed, and since the close of the year, opened for business. The ground on which it stands is owned or leased by this company. The depot superstructure has cost about $650,000.

"A depot company under the name of the Central Union Station & Railway Co. of Cincinnati was formed, one-half of the stock of which was taken by the Cleveland, Columbus, Cincinnati & Indianapolis Co., and the other half by this company. The depot company leased of this company the ground on which the depot and tracks are situated perpetually, for taxes and an annual rental of $28,410. The depot company, to pay for the superstructure, issued $600,000 of 6 per cent. preferred stock, $200,000 of which was taken, at par, by the Cleveland, Columbus, Cincinnati & Indianapolis Co., and the remainder by this company.

"During the year no effort has been made to sell the Columbus, Hope & Greensburg bonds, as, in the condition of the money markets, it seemed useless.

"The debt of the company during the year has been steadily reduced from the surplus earnings. At the close of the fiscal year, the company owed, in addition to current expenses, on bills payable, $469,000. For the coming year there is as much due the company from outside sources as it will probably be called upon to advance for other than current charges, except the balance required to complete the depot, estimated at $50,000. This, added to the bills payable, makes $519,000 to be provided for. The company should sell $100,000 of the preferred stock of the depot, as it would then still own one-half. This would reduce the debt to $419,000, or 6 per cent. upon the capital stock. If the stockholders can have patience to wait for dividends until this is paid off, it would be much better for them than to sell any of the bonds or stock the company holds; in other words, the company would be that much stronger. It would have the bonds and stocks in the treasury, and would owe its stockholders 6 per cent., to be paid at its option. As to how soon this $419,000 can be paid, it will depend on crops and general business. The wheat crop is already harvested, and is very fine. The corn and oat crop promises exceedingly well west of Indianapolis, and poorly east. The expenses, barring floods and accidents, will be moderate, except as to bridges. Advantage is being taken of present cheap prices to renew with iron two of the large wooden bridges on the road, leaving but two more large ones of wood.

"With fair crops and good fortune the above debt should be paid from current earnings during the fiscal year, and the property improved. The company, from its interests in the depot property in Cincinnati and Indianapolis, and from bonds and investments, will have a net income of over $80,000 during the coming year, leaving but $600,000 to earn from traffic to pay its fixed charges, and all over this can be applied to the extinguishment of the debt.

"During the year the Indianapolis Union Depot & Belt Railway has been reorganized, and the interest of this company appraised at $105,820, on which it receives a rental of $7,407, or enough to pay its own charges for use of same. At the same time, extraordinary railway facilities are provided in that city for the public and the railways at a moderate cost.

"Our relations with other lines during the year have been satisfactory and harmonious."

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

A RAILROAD SCHOOL.

The Vienna School for the Higher Education of Railroad Officials, which has now completed its first year of active work, is making its influence felt in several directions. At least two books on railroads have been published this summer and two more are announced which stand in direct connection with the work of this school. And now something similar is to be established at Berlin. At the end of the announcement of courses of instruction in Berlin University for the coming winter, it is stated that there will be courses of lectures "on Railroads and Railroad Management" with the hours and the names of the lecturers. It is not so thoroughly organized as the Vienna instruction, but it is obviously intended for the same purpose.

A special school of this kind may have either of two quite distinct aims. It may be intended to prepare young men for the duties of the profession which they expect to take up; or, on the other hand, it may be intended for men already at work in their profession, to give them a wider and more intelligent interest in the subjects connected with it, a general knowledge of principles which shall counteract the narrowing influences of routine. The Vienna school belongs to the latter class. It is not a preparatory school for boys who expect to become railroad officials; it is what its name implies, a school for the higher education of railroad men in subjects connected with their own line of work. In this respect it differs from the vast majority of special schools. Almost everything of the kind, from a theological seminary to a business college, is intended as a fitting school for people who have yet to begin the serious and successful work of their lives. Even institutions like the Cooper Union form but partial exceptions to this rule.

Such a preparatory school for railroad men did actually exist at Vienna from 1872 to 1877. It was organized somewhat on the plan of a business college, and was maintained by contributions from the railroads. First organized as an independent school, at the end of 1873 it was made one of the departments of the Vienna Business College (the others being the banking and the commercial departments). Instruction was given for about six months in each year. The required subjects in the railroad section were as follows: First year, Railroad Business Methods, Train Service, Telegraphy; also (unless the student was previously familiar with them) Mercantile Arithmetic and Geography. Second year, Geography and Statistics of Trade, Trade Goods, Railroad Technology, Railroad Charges, Railroad Administration, Railroad History; Revenue Systems; Elements of Law. There were optional courses in a variety of other subjects, such as various departments of law, political economy, modern languages and stenography.

This school was established and subsidized by the railroads as a means of furnishing them with trained officials. The subsidy was discontinued, not because the school failed to do its work, but because it did its work too well. In 1871 the railroad system was growing, and there was nobody competent to fill its positions. In 1877 the railroad system was at a standstill, while the school was each year preparing young men for places already well filled. The school was stopped because the supply of young men trained in it was already in excess of the demand.

But although they were not in a position to employ new men, the Austrian roads wanted to make the most of the men they already had; or rather, to give the men they already had the opportunity to make the most of themselves. The present school was established with that end in view. The idea was thrown out in an address before the Austrian Railroad Club at the beginning of 1881. It was warmly taken up by the Club, and in less than two years from the first suggestion of the idea the school was in active operation, with an efficient course of lecturers and a body of students, whose numbers were only limited by the capacity of the school itself. A year later—at the end of 1883—such additions had been made to the facilities that the school was able to offer a well-developed two-years' course of instruction. The subjects are as follows:

First Year.—Railroad Technology, Trade Geography, Political Economy, Book-keeping.

Second Year.—Railroad Law and History, Theory of Railroad Rates, Statistics of Trade and Trade Goods, Railroad Administration, Tax Laws and Procedure, with Electrical Engineering as an extra subject.

The school year lasts from October till May. Since the students are presumably engaged in active business through the day, the lectures all come between the hours of 5 and 7 p. m. The courses are so arranged that each student will have six or, at most, eight hours of lectures per week.

Examinations are to be held on the subjects of each year's course and certificates of proficiency given. Attendance on these examinations is not obligatory. The examination is given as a means of testing the progress made and carries no material advancement with it. The certificate of examination classifies the work of the candidate in each subject as satisfactory, good or remarkable. Of about 100 students who attended the lectures the first year one-half tried the examination and only five failed to pass.

The work of the school seems to be generally commended. The railroads give it their cordial support. All the railroads which centre in Vienna contribute according to their mileage; and—what is quite remarkable—some railroads which do not reach Vienna at all, and whose officials can therefore hardly share its advantages, have voluntarily offered to contribute to its funds. This is perhaps the best possible testimony to its national influence.

The question will probably suggest itself, could we not have something in this country which might serve the same purpose? Anything on the same *model* is obviously out of the question. Our geographical relations are enough to prevent it. We have no place that is at once the centre of railroad activity and railroad authority, as Vienna is for Austria. Our able men, old and young, are scattered all over the country. Their business ties them down; they cannot get together into one place. Even the most successful attempts, like that which the Pennsylvania Railroad makes for the interchange of ideas among its officials, necessarily can reach but few among the many that would value such privileges. The annual conventions of men in various departments of railroad work are invaluable in their way; but they deal only with more technical points, and do not involve courses of systematic study except to a few among the many that attend them.

The day is now past, if there ever was such a day, when a wide-awake railroad official could be content with mastering business routine or ordinary technical skill. The railroad system has grown to the point where even subordinate positions in its management have the importance of a public trust. The deepest industrial, political and social questions are in many instances the direct outcome of railroad development, and are in almost all cases affected by the action of railroads—whether railroad men intend it or not. The railroads have much to fear from ill-judged public action, and the public has much to fear from ill-judged railroad action. It is only with the utmost care that the danger in both directions can be avoided. Any one, be he railroad man or congressman, who acts hastily upon his own particular line of facts and conclusions to which his special work has led him, is liable to make serious mistakes, and to do much harm to the community.

A great many of our younger men feel this, and want to inform themselves on the industrial and social questions connected with their profession. But they encounter two difficulties. They do not know where to find their information, and thus have no means of testing their progress. There is no book which treats the whole matter systematically. Adams' "Railroads, their Origin and Problems," the nearest approach to any such book, is simply a brilliant fragment. Kirkman stops altogether short of this aspect of the subject. The United States Reports on Internal Commerce, along with much material of great value, contains much which the student would find of no use at all; and, what is still more unfortunate, they are out print. Simon Sterne's historical account of railroads in Lalor's "Cyclopædia of Political Science" is not, we believe, to be had separately. The most thorough studies of the subject are to be found in the arguments of men like Fink, Blanchard, Bowen or Atkinson; but these are not for sale at the book stores; they are printed for private distribution, and the beginner scarcely knows how to get hold of them. And in the rather bewildering multitude of such arguments, he does not know which he had better read, or in what order to take them up.

They are not like novels, or even like newspaper articles, which we take up at hap-hazard, often forgetting one before we read the next. The problems are so hard that it is no trivial matter to master them. They must be studied intelligently and systematically. It is difficult, if not impossible, for a young man in the midst of active business to do this by himself. But a little guidance and help would render it by no means impossible. And here, possibly, the purposes of the Vienna school might be carried out in a way suited to the conditions of this country. An institution might be organized on the same plan as the Society for Political Education, but devoting itself exclusively to studies connected with railroads. It should mark out courses of reading and study among works like those already referred to, and arrange that the books and pamphlets recommended should be made accessible to all at slight expense. It might extend its courses so as to include technical subjects on the one hand, and on the other hand books bearing more indirectly on railroad problems, such as Farrer's "State in its Relations to Trade," or Mulhall's "Balance Sheet of the World." It would probably not be practicable for such a body to hold examinations; but it could, from time to time, send out questions by which students could test their progress; and, finally, it could arrange for the publication of essays or arguments on these questions which were worth putting into permanent form.

The idea may be impracticable; it would certainly require some money, and much effort on the part of somebody, but we give it for what it is worth. Of this we feel assured, that there are many men who would welcome such an opportunity for professional studies. It would not, perhaps, enable them to make any more money, but it would give them a more intelligent interest in their profession, and enable them more fully to fill their place in the world, both as railroad men and as citizens.

Grain Shipments by Lake and Rail.

The lake vessels are faring hard this year. Though their rates have been probably the lowest ever known after harvest, the shipments of grain by lake have been decidedly light, much less than in any other recent year except 1882, when the failure of the corn crop of the previous year deprived them of their chief staple, and in 1881, when the low rates of the railroad war diverted their traffic to the railroads. During the nine weeks ending Oct. 4 the shipments by lake and river (the latter comparatively a trifling amount) and by rail have been, for 12 successive years:

Year.	By rail.	By water.	Total.	P. c. by rail.
1873	5,821,300	29,414,700	37,236,000	15.6
1874	5,146,500	24,517,500	29,664,000	17.4
1875	11,037,000	21,403,200	32,440,200	34.0
1876	14,754,600	21,024,800	35,779,400	41.2
1877	9,211,400	34,614,900	43,826,300	21.0
1878	11,331,300	38,695,900	50,027,200	22.5
1879	14,386,500	36,434,800	50,821,300	28.3
1880	18,002,800	37,207,100	55,209,900	32.6
1881	21,518,100	25,244,000	46,762,100	46.0
1882	17,935,900	24,074,000	42,009,900	42.7
1883	20,898,100	36,364,200	57,264,100	36.5
1884	18,640,700	29,904,900	48,545,600	38.4

Thus the water shipments this year, though larger than in 1881 and 1882, were smaller than in any other year since 1876—a year of railroad war—and only about as large a in 1873, when the total shipments were 11 million bushels less than this year. The proportion shipped by rail this year is larger than in any other year except 1876 and 1881, years of railroad war, and 1882, when the grain moved was largely required for

interior consumption, and the rail shipments as well as the lake shipments were smaller than in 1880 or 1881.

When the shipments by rail are an unusually large percentage of the whole, irregularities in rates may be suspected *unless the total shipments are small*, or water rates are unusually high. This year water rates are not high, but low, but the total shipments are much less than last year or 1880, and a little less than in 1878 or 1879, and the *amount* of rail shipments is little more than in 1880 or 1882, and 11 per cent. less than last year. The fact that the railroads supply a vast number of interior points which cannot be reached by lake and canal, prevents the reduction of rail shipments below a certain point, and as the population and consumption of these places continually increase, so the minimum limit of rail shipments advances from year to year. What that limit is no figures that we have will show, because a vast amount is shipped from inland Western stations to inland Eastern stations that is not recorded in any trade statistics, and this amount varies greatly from year to year, according to the crops of the country east of the Mississippi and south of the lakes, which, however, do not and cannot increase as much as those west of the Mississippi, where are great areas of fertile land waiting to be brought under cultivation. This year especially an unusually large proportion of the grain is produced west of the Mississippi, and therefore an unusually large proportion will be received at and shipped from the great Northwestern markets, and so will be recorded in the grain statistics.

The amount and proportion of rail shipments, however, are still affected by the rates charged, and it is certainly true that in the last few weeks they have been suspiciously large. In the six weeks to Sept. 13 the rail shipments averaged 1,894,500 bushels per week, and the lake shipments 3,121,000 bushels; but in the next three weeks, ending Oct. 4, the rail shipments increased to an average of 2,424 800 per week. while the lake shipments averaged but 3,200,000, or very little more than before. And in the week to Oct. 11 the rail shipments of grain from Chicago were larger than ever, with little or no increase in lake shipments, and all this time no increase at all in lake rates. To get a bushel of wheat from Chicago to New York by rail costs about 7 or 7¼ cents, against a regular rail rate of 15 cents. Under these circumstances the demand from places which the railroads alone can supply might enable them to hold their own, but it is not easy to see why they can be getting unusually large quantities without a reduction in rates. Last year water rates were higher and the railroads carried more after August than they have this year, but not so much in the three weeks after the middle of September, and last year in August and September rail shipments were largely increased by rebates granted by at least one of the lines—in September probably by several—and then the vessels also carried much more than they have carried this year.

In 1882, when rates were well maintained, the railroads in the three weeks in question carried 57 per cent. less than this year, the vessels but 22 per cent. less; even in 1881, when there was no pretense of maintaining rates, the rail shipments in these weeks were very little more than this year, though they were a larger proportion of the total shipments.

It is not particularly desirable for the railroads that the grain shipments should be large now. The greater the accumulation at the Northwestern markets in the fall, the larger the rail shipments will be in the winter, when they can get a somewhat higher price than at this season, though it is questionable whether a 30-cent rate can be had this year. As winter approaches the shipments of produce that suffers by freezing, like apples and potatoes, becomes very large and require a large part of the rolling stock, and so after navigation closes more cars are available for the through traffic. But the current rail shipments of grain are actually large, and it is only the lake shipments that are moderate. There remain but four or five weeks during which shipments made by lake can reach the seaboard by the water route, and with so large a crop of wheat to be marketed the vessel-owners probably expected more than the 1¾ cents per bushel from Chicago to Buffalo which they have been accepting for some time, against 3½ to 5 in September and October last year, 2¾ to 3 in 1882, and 2 to 4½ in 1881 during the railroad war. Probably the main cause of their disappointis the very small supply of corn, which more than offsets the large supply of wheat, and which, *when shipped for export*, is likely to go by lake chiefly, while for home consumption much of it must go by rail. But low rail rates also have doubtless had much to do with it. It was acknowledged that the rates were cut in the last week or ten days of September; but the reported increase of rail shipments for the week ending Oct. 11 indicates that there was not that general restoration of rates after September that was claimed, or that the engagements at the cut rates in advance of shipment were even larger than they usually are.

Academic Instructions in Railroad Economics.

We have herotofore called attention to the fact that a professional student of economics and political science, Mr. Arthur T. Hadley, of Yale College, has begun to give instruction there on railroads. It has heretofore been difficult to find in this country any one willing to make a serious study of such matters, and when one has desired to, it has been extremely difficult for him to find how he could do so—what there was to read and what was worth reading. Hardly any one in the country has followed closely the literature on the subject, and very few indeed who have given the subject any attention have had the training and the thorough grounding in the principles of economics that would enable him to judge well of the value of what has been written on these subjects, and become a guide to others desiring to study it.

We present below a programme of the instruction which Mr. Hadley offers during the current academic year, which will be interesting to many, not only as showing what is offered to students at New Haven, but also as indicating how they may direct their own studies at home.

RAILROADS: THEIR HISTORY, THEIR BUSINESS METHODS AND THE SOCIAL PROBLEMS CONNECTED WITH THEM.

Introduction.—The questio ns involved, and the methods of studying them.

I. *History of the Transportation System of the United States:*

1. Roads and Waterways; especially (*a*) the Erie Canal and (*b*) the Mississippi River.
2. History of Railroad Extension.
3. Railroad Consolidation down to 1872.
4. Fast-freight Lines, etc.
5. Railroad Pools formed previous to 1877: especially (*a*) the Missouri River pools and (*b*) the Southern Railway and Steamship Association.
6. Trunk-line Contests down to 1877; with accounts of (*a*) the "Evener" system, and (*b*) the Standard Oil contracts.
7. The Trunk-line Pool and the Joint Executive Committee; the trunk-line contests of the last seven years.
8. The Condition of the Railroad System to-day.

II. *Railroad Business Methods and their Effects upon the Community:*

1. Special Characteristics of Railroad Business.
2. Railroad Accounts; with especial reference to (*a*) the difference between the accounts of railroads and those of other lines of business; and (*b*) the questions involved in separating maintenance from construction account.
3. Railroad Reports and Statistics.
4. Railroad Expenses, with special reference to the distinction between fixed charges and other elements of expense.
5. Railroad Rates. (*a*) Actual practice of the railroads in making rates. Classification. Through and Local Rates. Special contracts. (*b*) Popular criticisms. (*c*) The attempt to base rates upon cost of service is wrong. (*d*) The principle of charging what the traffic will bear is right in itself, but liable to abuse. (*e*) Discriminations, right and wrong.
6. The Reduction in Rates during the last fifteen years, how effected. How cost of service becomes an element in charges based upon what the traffic will bear.
7. Competitive rates (*a*) against water routes, (*b*) in railroad wars.
8. The pooling system, in railroads and elsewhere. Its causes and effects.
9. Railroad profits. Railroad investments. Railroads and commercial crises.
10. Speculative Railroad Building and Management. (*a*) Parallel railroads. (*b*) Construction companies. (*c*) Other subsidiary corporations. (*d*) Conflict of interest between owners and management; (*e*) Between stock and bonds. Receivership.

III. *Foreign Railroads and Railroad Legislation:*

1. England (*a*) Railroad management and legislation down to 1872. (*b*) The Railway Commissioners and the investigation of 1881. (*c*) Comparison of English and American railroad service, traffic, rates, etc.
2. Continental Europe. (*a*) Summary of railroad history and legislation in Belgium, Russia, Austria, France, Italy. (*b*) The system of avoiding discrimination by extension of pooling arrangements into the fullest detail. (*c*) Continental traffic and rates compared with those of England and America.
3. General information on the development and character of the railroads of the world.
4. Comparison of state and private ownership.

IV. *Railroad Legislation in the United States:*

1. Brief summary of miscellaneous points. (*a*) Special charters *vs.* general railroad law. (*b*) Limitation of dividend. (*c*) Systems of taxation. (*d*) Liability on bills of lading or for performance of duty as carrier. (*e*) Accidents.
2. Subsidies. (*a*) Land grants. (*b*) Municipal subscriptions, etc.
3. The Granger movement.
4. State Railroad Commissions and state control of rates. (*a*) Pro rata and short-haul bills. (*b*) Commissions with active powers (Georgia, California, etc.). (*c*) Commissions to secure publicity (Massachusetts, etc.).
5. Proposed Congressional Legislation, History of the Reagan bill and the various substitutes offered.
6. Present needs and prospects.

The instruction is mainly given by lectures, but it is intended that there shall be the freest discussion, by the whole class, of all points that are doubtful or obscure.

The following course of reading is marked out in connection with the lectures for the coming year:

Adams—Railroads, their Origin and Problems.

Farrer—The State in its Relation to Trade: Chapters VIII., X., XI., XII., XVII.

Sterne—Railroad Poolings and Discriminations.

Black—Letter to the Committee of the New York Chamber of Commerce, Nov. 16, 1880.

Letters of Messrs. Fink and J. J. White on the question of pooling.

Fink—Argument before House Committee on Commerce, January, 1884.

Besides these the students are urged to read a variety of works by Blanchard, Cooley, Atkinson and others, to which references are made in the lectures. They are also encouraged to prepare original essays on special topics connected with the course. These essays are then read and made the subject of discussion by the class.

Signals.

On another page we print a communication from a correspondent advocating the use of semi-opaque glass for signal lanterns on the ground that the light corresponding with white day signal should be positively white and not yellow, and meeting the objection of the reduced range of visibility of the ground glass by saying a signal should not be seen too far off. Mr. Ralph also believes that day and night signals should be alike in form as well as in color. This arrangement would certainly prevent the signal being seen at any great distance. A light, backed by a reflector, would be bright and clear at a distance where an illuminated semaphore arm of porcelain or ground glass would be quite invisible. Such an arrangement answers well in Germany, where it is extensively used for switch indicators in yards, but it is totally unsuited for main-line signals, which to be of any practical use must be visible from a distance.

Our correspondent seems to think otherwise, but we cannot agree with him. Main-line signals should be visible as far off as possible, so as to give a runner timely notice of the state of the road ahead. It must be borne in mind that an engineer cannot be solely occupied in looking for signals. The care of his engine, the state of his fire, the water level, and the working of his pumps and injectors all demand attention. If a man can see his clear signal a mile or two ahead, he is free to walk round his engine, and give the bars a drop of oil, and see that all is going on smoothly. This is often very essential on a fast engine making a long run, especially if any of the rubbing surfaces have previously shown a tendency to heat.

In order to provide against the case of a lamp going out, or the glass being covered with ice or snow, the absence or invisibility of a signal must always be regarded as tantamount to a "stop" signal. An all-right signal which cannot be seen, therefore, involves that needless application of the brake which Mr. Ralph deplores and which involves loss of time, an extra expenditure of fuel in getting up speed again, and a small amount of wear and tear.

Signals are most needed in snowy and foggy weather, and if the brightest signals are then obscured, would a signal covered with paper be visible at all? We want, if possible, a light for signals that will penetrate a fog. Experience with light-houses has shown that the electric light is, in the great majority of cases, superior to any other mode of illumination in misty and foggy weather. In other words, the electric light is visible when the beams of the ordinary light-house oil lamp do not reach the eye. Therefore it will probably be a great advantage if the electric light can be so generally introduced as to be available for railroad signals. It has within the last few months been applied to both fixed signals and locomotive headlights, with results that promise ultimate success.

The improper display of hand lanterns on a moving engine should not be corrected by an alteration in legitimate signals, but by greater care in the use of hand lanterns. No one has any business to show a lantern in such a way that it can be mistaken for a signal; and we believe this is thoroughly well understood and acted upon by every railroad employé possessed of a little common sense. Such mistakes can be guarded against by placing main-line signals on tall posts, where the signal light is high above ordinary

lights, and where the semaphore arm is plainly visible against a sky back ground.

The majority of signals err both by night and day in not being sufficiently distinct and visible, and we cannot but regard any movement to obscure signals as a step in the wrong direction.

We have already (Sept. 12 last, page 665) published particulars of the novel "International Inventions Exhibition," which is to be held in London during the summer and fall of 1885. Applications for space will be received up to Nov. 1. It will in all probability be as great a success as its predecessors, the Fisheries and Health Exhibitions. A well-known mechanical engineer, Sir F. J. Bramwell, is Chairman of the Executive Council, which comprises several of the eading scientific men and engineers of the day. Among them are Sir F. Abel, Mr. Lowthian Bell, Mr. W. H. Preece, Mr. John Robinson (Sharp, Stewart & Co.), Mr. Warington Smyth, Sir E. J. Reed, Colonel Bolton and Sir Philip Cunliffe Owen. These gentlemen are well-known authorities in explosives, iron and steel, telegraphy, locomotives, scientific instruments, ships, water supply, and last, not least, the successful management of exhibitions, which has become an art in itself. We trust that this country will be well represented at this exhibition, which is devoted to a subject in which Americans may win great credit.

The latest plan for equalizing passenger traffic, when a division is agreed upon, is given in a circular to the railroads of the Joint Executive Committee recently issued by Mr. Fink. It is, substantially, to substitute for differential fares the payment of commissions under the direction of the Joint Executive Committee itself. That is, if the reports of tickets sold should show that the Erie, for instance, was getting a smaller share of the travel than the share agreed upon, the Chairman of the Joint Executive Committee would authorize the payment of commissions for the sale of Erie tickets until it should secure its proper share, fixing the amount of commission to be paid as well as the time during which it might be paid.

There are at least two grave objections to such a plan. In the first place, it seeks to draw travel to a route whicl. for any reason is not popular, not by selling tickets for what they are worth, but by employing men to induce people to buy what they do not want, and that not regularly but at intervals. By the differential fare arrangement the passenger gets the whole advantage of whatever reduction is required to attract travel to a route which does not get it at the prices charged by the most popular routes. If agents are paid to secure these passengers, they will almost certainly give the ticket-buyer part of the commission, and to pay the agent and attract the passenger both will be likely to require a larger rebate that the reduction made by an open differential fare.

Worse than this, the plan would tend to make all ticket sellers work to bring about precisely the condition of things which is to be avoided. They would receive commissions only when travel had been distributed in proportions different from those agreed upon and desired by the Joint Executive Committee. Consequently they would do their best to prevent the agreed division until they were offered the reward for bringing it about. That is, being paid only for making things right after they had gone wrong, they would be pecuniarily interested in making things go wrong as far and as often as possible. It is as if a mechanic should be paid one price for doing good work and two prices for undoing bad work.

The condition of passenger business between the Eastern seaboard and the West is very unsatisfactory, and in some respects peculiar. The working of the passenger pool organized in the spring of 1882 had been most satisfactory, resulting in a decidedly larger passenger income than had been had before. The opening of new lines between New York and Chicago, however, sometime ago, made it impossible for the old trunk lines to control the business, at least without the help of the Grand Trunk, which had never been a party to the agreement. When it appeared the Grand Trunk would not join, and that the usual methods of competition must be met, the other roads maintained their organization, but suspended their rules against paying commissions and gave up for the time the effort to divide the business, and since July all but one have been paying commissions, and the larger number of tickets have passed through scalpers' hands, they receiving a commission of about $5 on a ticket from New York to Chicago, and usually allowing the buyer about one-half of this amount. This has continued for two months and a half with little change, resulting in a sacrifice of a very large part of the earnings that might be had from the through passenger travel. The losses sustained have been so large that by this time some adjustment might have been looked for but for the trouble about the Baltimore & Ohio. That company, having had its New York through line by way of Philadelphia spoiled, is now actively engaged in trying to prevent the Pennsylvania from getting the benefit of any of the traffic thus kept from going by the Baltimore & Ohio, and so far from helping to make a new and more comprehensive combination is not inclined to do anything which will limit its freedom of action, and has withdrawn from the emigrant pool. It therefore looks as if there might be a long continuance of the big profits of scalpers and small ones of railroad companies from the through passengers.

Judge Thomas M. Cooley, of Ann Arbor, Mich., who was one of the "Advisory Commission," has been selected as Arbitrator to make the apportionment of Chicago shipments under the agreement recently made to reopen the question, a work for which his clearness of insight, fairness of mind and long experience as judge on the bench have recommended him.

The Chicago railroads are now engaged in war over passenger rates between Chicago and the Missouri River, the rate for several days having been $1, or a few cents more for the distance of 490 to 500 miles to Council Bluffs, Atchison, St. Joseph, Leavenworth and Kansas City, made by charging full fare and paying a rebate at the end of the journey, to prevent traveling at the same rate to intermediate points. This contest involves the Milwaukee & St. Paul and the Northwestern, which have lines to Council Bluffs only; the Rock Island, the Chicago, Burlington & Quincy, and the Wabash, which have lines both to Council Bluffs and to what are known as the "Southwestern" Missouri River points, and the Chicago & Alton, which runs trains to Kansas City only. The regular fare is, we believe, $13.90. The occasion of the contest is reported to be the issue by the Rock Island of an immense number of transferable 1,000-mile tickets in payment for advertising. These tickets were sold by those who had acquired them at such prices as they could get, and so many of them came upon the market—that is, to scalpers' offices—that they were forced to sell at a very large discount, which enables the scalpers to sell these tickets at much less than regular rates, thus demoralizing rates to all competitive points. Truly a very large amount of advertising must have been done to have required tickets enough to cause much trouble, but of course trouble is sure to be caused by a reduction made in this way as much as in any other, provided tickets enough are issued. Advertising is largely paid for by passes good only for the person to whom issued, but these are not available for many persons who live off the line of the railroad. Payment in regular transferable tickets is, in itself, just as legitimate as any other "paying in trade," but in this case it is not easy to see how it can be done on a large scale without demoralizing rates. If a company should pay for its coal as well as its advertising in this way, the effect might be to reduce all rates one-half in a short time, because there would be more tickets in the market than there was any demand for, with the usual effect of an over-supply. In such cases a railroad company sells its services in advance, and what it gives in payment is virtually a due bill, payable in a special kind of service, for which there is a limited demand.

The receipts of wheat at the Northwestern markets continue very large, but there is some change in their distribution. Chicago is receiving less than in earlier weeks, and St. Louis much less, but Milwaukee gains slowly, Toledo more than holds its own, and the receipts at Detroit have increased greatly and have become much more than ever before known, indicating that not only is the Michigan crop coming forward rapidly, but that the Wabash is carrying much by way of Detroit which formerly it carried to Toledo. Down to the end of July the receipts of grain of all kinds at Detroit this year had been at the average rate of 118,764 bushels per week; in August they were 365,979 and in September 394,182 bushels per week, and in the week to Oct. 4 675,674 bushels. Detroit's largest receipts in any week last year were 482,635 bushels; in 1882, 420,552, in 1881, 365,411, and in 1880 564,256 bushels.

Toledo and Detroit, the two markets which receive from the Wabash, received no less than 1,488,078 bushels of wheat in this week to Oct. 4, which is 40½ per cent. of the whole.

Duluth continues to have large receipts of wheat, exceeded in the week in question only at Toledo and Chicago and but slightly at Chicago. Duluth's wheat receipts for the four weeks to Oct. 4 were 3,062,375 bushels, while its total grain receipts for the other 36 weeks of the year were 1,604,358 bushels, and its wheat receipts during the whole of previous years have been:

1880.	1881.	1882.	1883.
2,978,629	3,568,026	4,198,133	*6,812,412

*All grains; the receipts of grain other than wheat were but 113,922 bushels in 1882.

Last year the receipts at Duluth were larger in October, and not much less in November, than in the last three weeks of September, and if there is a corresponding movement this year it will receive during the three fall months about 8,300,000 bushels, and during the year 10,300,000 bushels.

The Erie Earnings in August and for Eleven Months.

The earnings of the New York, Lake Erie & Western Railroad last August were larger than in any previous month since November. The increase over July is small ($76,241=5 per cent.) in gross earnings, but was very large ($170,355=38 per cent.) in net earnings, there haveing been a decrease of $94,114 in the working expenses from July to August, and the expenses being less last August than in any any other month since March, 1880. But while there is so great an improvement in comparison with previous months of this year, the decrease compared with last year is larger than in any other month save one, and the decrease in net earnings is larger than in any other month whatever. For in August first appeared the direct effects of the "enterprising" policy that followed the opening of the Chicago & Atlantic Railroad to Chicago, when for a time the Erie secured an enormous proportion of the total Chicago shipments—at one time more than half of them, and the net earnings and profits on the leased Ohio line, which had averaged $493,300 per month during the ten months ending with July, and were $617,000 in July, rose suddenly to $1,100,000 in August. This, we say, was the direct effect of the enterprising policy then followed; the secondary effect appeared a little later, after November, when these net earnings and profits from the leased line for the eight months ending with July averaged $275,507 per month—as much in four months as in August year.

The gross and net earnings and working expenses of the Erie proper in August were:

	1884.	1883.	Decrease.	P. c.
Gross earnings	$1,534,427	$2,068,464	$534,037	25.8
Expenses	913,193	1,099,943	186,750	17.0
Net earnings	$621,234	$968,521	$347,287	36.0

Both gross and net earnings were larger in August last year than in any other month in the history of the road except in the next month, where they were nearly the same.

For the seven years since the reorganization the August earnings and expenses have been:

	Gross earnings.	Expenses.	Net expenses.
1878	$1,445,929	$876,125	$569,803
1879	1,450,223	858,986	591,237
1880	1,606,872	957,685	649,187
1881	1,772,895	1,095,524	677,371
1882	1,843,144	1,095,067	748,077
1883	2,068,464	1,099,943	968,521
1884	1,534,427	913,193	621,234

Thus the gross earnings were less this year than in any other since 1879, and even 13½ per cent. less than in 1881, during the railroad war (when an exceptionally large and profitable coal traffic kept up the earnings. The working expenses were also less thau in any other year since 1879, and so with the net earnings, which, however, were nearly as large as in 1879, and but 8¼ per cent. less than in 1881, owing to the exceptionally small working expenses thi year.

Meanwhile the earnings and expenses of the leased New York, Pennsylvania & Ohio Railroad were:

	1884.	1883.	Decrease.	P. c.
Gross earnings	$480,568	$754,253	$273,865	36.3
Expenses	307,845	380,948	73,103	19.2
Net earnings	$172,723	$373,305	$200,582	53.7

The rate of decrease was thus much greater on this road than on the Erie itself, namely, 36 per cent. against 26 in gross earnings, and 54 against 36 in net—which was to be expected, as the vast sudden increase of traffic last year was chiefly in freight from the West passing over the New York, Pennsylvania & Ohio road.

The earnings and expenses of this Ohio railroad in August for eight successi ve years have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1877	$421,488	$276,795	$144,693
1878	377,453	269,089	108,364
1879	415,364	313,143	102,221
1880	475,204	314,878	160,326
1881	462,523	320,391	142,132
1882	528,430	304,663	223,767
1883	754,253	380,948	373,305
1884	480,568	307,845	200,582

Thus the gross earnings, though 36 per cent. less than last year and 9 per cent. less than in 1882, were larger than in any previous year. The working expenses since the lease to the Erie are not charged as in previous years, but some things are included not previously charged as working expenses, which makes them larger than by the old method; yet these expenses this year were less than in any other, except 1882, since 1873. Considering the amount of traffic and gross earnings in August last year, the working expenses were astonishingly small—only 50½ per cent. of the earnings, while they have usually been from two-thirds to seven-eighths or more, and were 64 per cent. this year, when we may suppose that severe economy was practiced. The net earnings, though 54 per cent. less than last year and 10 per cent. less than in 1882, were larger than in any previous year. The fact that the gross and net earnings have been

larger than in any year previous to 1882, indicates that the lease has been advantageous to the traffic of this road. To its owners it has been still more so, as the rental has, on the whole, exceeded the net earnings, though in August there was a profit on the lease of $18,942 this year, and $131,544 last year. This is the first month since November that there has been a profit on the lease, though in July the loss was but $9,576.

For the eleven months of the fiscal year ending with August the earnings and expenses of the Erie proper have been less than last year by the following amounts and percentages:

	Gross earnings.	Expenses.	Net earnings.
Decrease	$2,583,290	$1,252,997	$1,330,293
Per cent	14	10¾	22

Last year by the end of August there had been a *profit* of $286,686 on the lease of the Ohio road, which had then lasted four months, while this year there has been a *loss* of $312,592 on the lease, which has been in force the entire 11 months. As there was a large profit on the lease in September of last year, doubtless for its whole term of 16 months the net earnings have somewhat exceeded the rental. If in any year the rental exceeds the net earnings the difference, which has to be paid at the time by the Erie, becomes a debt to it, payable by the lessor company in any year when the net earnings exceed the minimum rental of $1,757,055.

The profit and loss on the leased line make the net income of the New York, Lake Erie & Western for the 11 months after paying expenses and the rental of the Ohio road:

	1884.	1883.	Decrease	P. c.
Income	$4,390,681	$6,320,252	$1,927,571	30.5

The decrease is equal to the dividend on the preferred stock, and about $1,440,000 more, while the interest on the second consolidated bonds is $1,958,000.

Last year the profits in September were nearly as large as in August. This year, owing to greater disturbance of rates for part of the month, they may not be as great in September as in August. In 1878, 1879, 1881 and 1883 they were the greater in August; in 1880 they were $109,000 and in 1882 $63,000 greater in September. We should say that they are not likely to have been more than $650,000 this year, which is $387,000 less than last year, making the decrease for the year about $2,316,000, and leaving them about $5,040,000, which is $435,000 more than the interest on the company's own funded debt as it stood at the beginning of the year. Last year it had rentals, guaranteed interest, etc., to pay amounting to more than $1,600,000. This year these charges have probably increased, as the interest has been advanced to the Chicago & Atlantic and perhaps the new coal roads for a longer time. The company has some other sources of income than its net earnings from its railroads, but they usually do not add much to its *net* income.

More September Earnings.

Last week we had reports of September earnings from 19 railroads, this week we have them from 27 more. The 19 last week were much the more important, however, having 40 per cent. more miles and 60 per cent. more earnings than the 27 reporting this week. Of these latter, seven had larger earnings this year than last in September. In the aggregate, they had a decrease of 9¾ per cent. in gross earnings, with a small increase in mileage. The 46 roads that have now reported had the following aggregate mileage and earnings and average earnings per mile in September:

	1884.	1883.	Inc. or Dec.	P c.
Miles	36,973	35,152 +	1,821	5.2
Earnings	$18,799,715	$19,846,884 −	$1,050,169	5.3
Earn. per mile.	508	564 −	56	10.0

All but one unimportant line of the 13 west and northwest of Chicago that usually report have now reported, and with the following result:

	1884.	1883.	Inc. or Dec.	P. c.
Miles	13,823	13,281 +	542	4.1
Earnings	$6,868,347	$7,316,968	−$448,621	6.1
Earn. per mile.	497	551 −	54	10.0

This is not doing well, but it is better than the same roads did in August, when their aggregate decrease was $626,314. It is a larger decrease than in any month but August, however. The changes of the principal roads then reported we commented on last week; of those reported now the Burlington, Cedar Rapids & Northern gained a trifle; the Iowa lines of the Illinois Central and the Marquette & Ontonagon each lost 20 per cent.

The number of roads north of the Ohio and east of the Chicago & Alton road that have reported so far is 14, a considerable number, but only one large, and including none of the great lines which cross this territory from east to west, and having in the aggregate only as many miles of road as a single one of the railroads northwest of Chicago. Only two of the 14 had any increase in earnings in September—the Evansville & Terre Haute and the Ohio Southern. The Illinois lines and Southern Division of the Illinois Central, which form nearly one-third of the mileage reporting, had a decrease of 15 per cent., the Alton & Terre Haute Main Line a decrease of 18 per cent.; the three Michigan roads reporting, decreases from 15⅓ to 20 per cent. Six of the roads here had a greater loss in September than in August, and six had a smaller one. They cannot be depended upon to reflect the general course of earnings in this district, which is one of the most important traffic districts in the country. In the aggregate the 14 roads had a decrease of 11⅓ per cent. in September.

A number of Southern roads report this week, but the six together do not nearly equal in earnings, though they exceed somewhat in mileage, the Louisville & Nashville whose earnings were reported last week. Of the whole number only the Kentucky Central has any increase in earnings. Most of the roads now reporting belong to the Chesapeake & Ohio system. The Chesapeake & Ohio itself reports a decrease of 16 per cent.; the others smaller losses. The Mobile & Ohio lost 14⅜ per cent.

West and southwest of St. Louis the roads reporting are too few and small to show anything concerning the course of earnings, except that those depending on Kansas and South Missouri traffic are doing extremely well, the Fort Scott & Gulf having an increase of 6 per cent. over its large earnings last year, and the Fort Scott & Wichita a much larger gain in proportion, which is doubtless chiefly due to the opening of new road, while last week the St. Louis & San Francisco reported a very large gain.

In the East we have reports only from the great Grand Trunk and the little Hoosac Tunnel & Western, the latter showing a gain of 34 per cent.; the former a loss of 11 per cent. The Grand Trunk's decrease was the largest since June. For six months its decreases have been:

April.	May.	June.	July.	August.	Sept.
$221,152	$175,613	$229,169	$94,527	$106.071	$182,411

In the other three months of the year its decrease was at the rate of $136,348 per month. The course of its earnings reflects to some extent that on other trunk lines.

Chicago through and local shipments eastward of flour, grain and provisions for the week ending Oct. 11 last were 55,640 tons, against 49,052 in the corresponding week of last year and 23,188 in 1882. The shipments are surprisingly large, considering the very low lake and canal rates, if, as has been claimed, rail rates were strictly maintained. The number of tons shipped and the percentage going by each railroad in each of the last six weeks have been as follows:

	Week ending—					
Tons:	Sept. 6.	Sept. 13.	Sept. 20.	Sept. 27.	Oct. 4.	Oct. 11.
Flour	3,774	2,785	3,823	5,396	7,186	9,403
Grain	15,531	17,154	22,916	26,514	33,592	36,235
Provisions	7,980	8,263	7.420	8,579	8,636	10,002
Total	27,285	28,202	34,159	40,516	49,414	55,640
Per cent.:						
C. & Grand T.	9.6	10.1	8.4	6.6	2 8	3.7
Mich. Cen.	10.7	8.3	8.7	17.0	19.6	15.3
Lake Shore	19.0	15.0	14.7	15 5	17.2	26 0
Nickel Plate	9.9	11 5	8.2	7.7	11.8	12 3
Ft. Wayne	16.0	19.3	20.8	17 3	15.6	12.8
C., St. L. & P.	13.6	16.6	14.5	16.6	16.9	11.5
Balt. & Ohio	12.2	7.7	9.1	8.0	9.4	7.9
Ch. & Atlantic.	9.0	11.5	15.6	11.3	6.7	10.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

The shipments last week were 12 per cent. more than the large ones of the previous week and were the largest since June and with two exceptions the largest since April, though in May and June the rate was but 15 cents, against 25 now. The shipments were larger than they have ever been at this season before, larger even than in 1881, when 12½ cents was a commoner rate than 15 probably. A general cutting of rates would account for the large shipments, but we are assured that there is nothing of the kind. If there is not, then the Chicago railroads are having exceptionally large earnings for their eastward traffic. It is difficult to see what has caused the increase in rail shipments. The larger part of it since the third week in Septemper has been grain (13,319 tons out of a total increase of 21,481 tons), but the total shipments of grain have not increased, and what the railroads have gained has been taken from the lake vessels, which are carrying at extremely low rates and getting little to do. The vessels, it is true, cannot carry much for interior Eastern markets, but it is difficult to believe that the demand of those markets has increased so greatly and suddenly as to increase the Chicago rail shipments 58 per cent. in three weeks. Neither is it usual for shipments to increase directly after an advance of 40 per cent. in the rates. In all probability the large shipments of last week were carried at the cut rates of the week before, though possibly the new engagements were at full rates.

The notable features in the percentages are the continued very small shipments by the Chicago & Grand Trunk, the unusually large percentage of the Lake Shore, and the small one of the Fort Wayne. The three Vanderbilt roads together took 53.6 per cent. of the whole; the two Pennsylvania roads, 24.3. Generally the roads getting less than their usual proportions were those which are over in the pool. Again the large provision shipments went chiefly by the Pennsylvania roads, the Chicago & Grand Trunk taking 9⅛ per cent., against the Lake Shore's 21⅛, the Fort Wayne's 18¾, and the Chicago, St. Louis & Pittsburgh's 28⅜. The Nickel Plate next to the Lake Shore took the largest amount of grain, and the Lake Shore and the Michigan Central together took 57¾ per cent. of the flour.

Lake rates for some weeks have been 1½ cents a bushel for corn and 1¾ for wheat from Chicago to Buffalo, which is lower than ever before known (except, perhaps, for a few days) at this season. Canal rates remain at about 4 cents for corn and 4½ for wheat from Buffalo to New York, which is much higher, comparatively, than the lake rates, and probably leaves some profit to the boatmen. Most of the shipments from Buffalo go by canal, which is an indication that rail rates are not much demoralized.

Ocean rates Tuesday were 3½d. to 3⅝d. for grain by steamer to Liverpool from New York and 4d. to 4⅛d. from Baltimore. The grain exports have been unusually light of late weeks, and considering that fact the ocean rates are well maintained. For the three weeks ending Oct. 4 these have been (from all Atlantic ports) for five years:

	1880.	1881.	1882.	1883.	1884.
Flour, bbls.	425,826	344,546	549,237	510,844	485,516
Grain, bu.	16,185,578	8,347,957	10,233,041	7,808,811	4,984,260

The passenger earnings of the Chicago, Burlington & Quincy Railroad during the seven months ending with July this year *increased* $184,120 (6 per cent.) over the corresponding months of last year; but in August there was a *decrease* of 7 per cent. in the passenger earnings, an indication, perhaps, that the people on the road feel poorer than they did earlier in the year. There had been some decrease in freight earnings throughout the year, amounting to 2 per cent. for the seven months and 3¾ per cent. in August, not important at any time. The increase in the mail, express and miscellaneous earnings in August was the very large one of 55 per cent., and nearly balanced the decrease in freight earnings. For the eight months ending with August the increase in this item of earnings, which is usually counted beneath consideration, was $178,512, or 22¼ per cent., converting what otherwise would have been a decrease of $105,000 in the total earnings into an increase of $73,700.

The acres of land sold by the Union Pacific last September were more than the total sales of any recent *year* previous to 1884, and more than the aggregate sales for the three years 1880, 1881 and 1882. But the land now sold is chiefly grazing land, which brings but a very small price per acre, and heretofore has been entirely unsalable. The sales in September were 1,224,000 acres, at an average of 80 cents per acre. Since 1879 the sales have been:

Year.	Acres.	Amount.	Per acre.
1880	276,000	$1,253,040	$4 54
1881	196,000	905,560	4.61
1882	398,000	1,771,100	4.45
1883	1,166,000	4,081,000	3.50
1884 (to Oct. 1)	4,070,000	6,186,400	1.52

This very rapid disposal of what heretofore have been unsalable goods is of very great importance to the company. It lessens its debt at a rapid rate at a time when it has become oppressive. A few years more of sales at this rate would enable it to reduce its capital account largely.

The traffic and earnings of the whole system of New York elevated railroads for the six fiscal years ending with September last have been:

Year to Sept. 30.	No. passengers.	Earnings.	Earn. per passenger.
1879	46,045,181	$3,526,825.26	7.15 cts
1880	60,831,757	4,612,975.56	7.58 "
1881	75,585,778	5,311,075.85	7.03 "
1882	86,361,029	5,973,633.41	6.92 "
1883	92,124,943	6,386,505.53	6.93 "
1884	96,688,992	6 723,831.90	6.95 "

The traffic, which increased very rapidly for the first few years after the roads were opened, is now growing quite slowly, the percentages of gain in the several years over the previous years having been: 1880, 32 per cent.; 1881, 24½; 1882, 14; 1883, 6¾; 1884, 5 per cent. The increase in the one year from 1881 to 1882 was greater than the increase in the two years from 1882 to 1884. This was to be expected, because on the whole the traffic is not likely to increase much faster than the population, and, next, the roads which are most used have approached the limits of their carrying capacity. In the busy hours the trains are as close together as they can safely be run, they have as many cars as the engines can haul, and the engines are as large and powerful as the structure will bear. When the west side of the city is built up between Fifty-ninth street and Harlem, doubtless there will be a very large increase of travel, a considerable part of which can be forced over the Ninth avenue line, which could easily carry six or eight times as many as it now gets.

The New York elevated railroads now carry passengers all day Sunday for a fare of 5 cents, the rate charged on week days, and heretofore on Sundays also, from 5½ to 8½ a. m., and from 4½ to 7½ p. m. It is probable that this will be followed, especially in pleasant fall and spring weather, by a very large increase of travel. The greater part of the Sunday traveling is not necessary traveling like most of the week-day traveling, and to many time does not seem valuable on Sunday. A great many poor people take their children on little trips on that day, by street cars if they can do no better, and when they can have a ride for eight miles or more in the sunny hours for five cents on the elevated railroads, it will be preferred by many. The roads also lead to some pleasant open country north of the city which is already a favorite resort when the weather is too cool for visiting the seaside. A five-cent fare on the elevated railroads seemed likely to flood these places with excursionists on pleasant Sundays.

The result of the experiment of carrying at a 5-cent fare last Sunday, however, was not wholly satisfactory. The Ninth Avenue road south of Fifty-ninth street and the Second Avenue road, which heretofore have not been open on Sunday, were worked all day. Compared with the corresponding Sunday of last year there was an increase of 64,828 passengers, from 151,777 to 216,605; but the gross revenue decreased just $1,000, from $11,833 to $10,833. There was a little showery weather in the afternoon just about the time when people would naturally go out most, and this may have largely reduced the travel. As trains were run on two lines not open last year on Sunday, the working expenses must have been increased materially. The increase in passengers on the Third Avenue and the Sixth Avenue roads, which have always been worked on Sunday, was from 147,458 to 178,629, or 31,171 = 21 per cent., and the decrease in revenue on them was from $11,497 to $8,933, amounting to $2,564, or 22¼ per cent. Of course one day's experience is not enough to prove whether the experiment will be successful or not. In spite of the fact that the reduction had been widely advertised, doubtless it was not familiarly known to all the men, women and children who might have taken advantage of it, especially on the lines of the Second and Ninth Avenue roads, where there is a very large tenement-house population, which, probably, does not read much, but which

usually keeps very well informed by word of mouth about such things. The weather is generally charged with greatly reducing the travel, and the afternoon shower certainly came at a very bad time; but most of the day was very fine—much finer than an average Sunday for more than half of the year.

The experiment is likely to throw light on the question of the effect of low fares on week days as well as Sundays. That is, if the receipts are not increased on Sundays by a reduction of the fare from 10 to 5 cents, they are much less likely to be on week days, when a much larger proportion of the travel is necessary, though possibly a larger number could be diverted from the street cars on that day. It is possible that, if the low fares do not bring out a profitable travel on the Second and Ninth Avenue roads, it may be advantageous for the company to close them on Sunday but continue the low fares on the other roads, which would then have a larger travel, while the expenses of the roads with thin traffic would be saved. It was on them, however, that a large development of traffic was to be hoped for, as they can give cheap excursions nearly or quite into the country for a large population to whom the difference between 5 and 10 cents means a good deal.

Record of New Railroad Construction.

Information of the laying of track on new railroads is given in the present number of the *Railroad Gazette* as follows:

Catonsville Short Line.—Track laid from St. Agnes, Md., west to Catonsville, 6 miles.

Columbus & Rome.—Extended from Sulphur Springs, Ga., north by east to Stinson, 4 miles. Gauge, 3 ft.

Greenwood, Laurens & Spartanburg.—Track laid from Greenwood, S. C., north 8 miles.

Minneapolis, Sault Ste. Marie & Atlantic.—Extended west to Turtle Lake, Wis., 15 miles, and east to Soft Maple, Wis., 10 miles.

New York, Philadelphia & Norfolk.—Extended from Franktown, Va., southward to Eastville, 12 miles.

Wisconsin Central.—Track on the *Minnesota, St. Croix & Wisconsin* line is extended from Emerald, Wis., west to New Richmond, 19 miles.

This is a total of 74 miles of new railroad, making 2,880 miles reported to date for the current year. The total track reported laid to the corresponding date for 13 years past is as follows:

	Miles.		Miles.
1884	2,880	1877	1,629
1883	4,835	1876	1,770
1882	8,190	1875	630
1881	5,450	1874	1,242
1880	4,275	1873	2,955
1879	2,619	1872	5,312
1878	1,527		

These statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

Plan for Maintaining Passenger Rates.

Commissioner Fink has just submitted the following plan to the general managers of the various roads in the territory of the Joint Executive for settling the existing difficulties regarding east and west bound passenger traffic:

Experience has shown that the maintenance of passenger fares in the territory of the Joint Executive Committee can only be substantially assured by a division of the earnings from competitive traffic in fixed proportions among the railroad companies interested. The efforts of the Joint Executive Committee during 23 months, commencing with Sept. 1, 1882, fully demonstrated the practicability of controlling passenger fares by a division of traffic. Unfortunately, the opening of the new roads which did not become parties to the division, and the want of co-operation of some other roads, caused a suspension of the methods that had proved at least partially successful, and the 31st of July the agreements for division of traffic could no longer be carried out. Since that time all the various railroad companies have secured traffic in any way that seemed proper, and the result has been great reduction and general demoralization in passenger fares. The question now arises, and has to be decided by the managers of the railroad companies interested in this business and competing for it, whether the present state of affairs shall continue and grow worse, as it necessarily must, or whether other and better efforts shall be made to bring the business under the control of the managers of these roads. The experience of the past shows in what direction this can be done; it also shows in what particulars the methods applied may be improved upon, and how they may be changed in order to meet the views of some of the parties who have heretofore failed to co-operate. There are three main points to be considered, namely:

First—The method in which the division of traffic is to be carried out so as to enable each road to earn its allotted percentage. This has heretofore been attempted by means of differential fares. It is claimed by some of the roads that, if commissions are allowed to be paid to agents for securing the traffic for companies that otherwise could not obtain it at equal fares, this would overcome the objections now existing to the differential fare plan. This suggestion is no doubt worthy of consideration, and should be tried, with the understanding, however, that the payment of commissions should be under the control of the Committee, through its Chairman, and under such rules as would reduce the payment of commissions to a minimum, and prohibit their payment except where necessary for the purpose of bringing about the agreed division of traffic.

Second—A full report of all competitive and interchange traffic should be rendered to this office in such detail as may be necessary, so as to secure to each party, with absolute certainty, the correctness of accounts.

Third—The division of traffic should be extended over a larger number of competitive points than heretofore, and include all the traffic described in schedule "A," hereto attached, and for which full statistics are now prepared. It should extend to many other private points for which experience demonstrates its necessity, and as soon as the necessary arrangements can be made.

The question is now submitted to the roads, whose co-operation is necessary to carry out the contract, whether they will take up the question of the division of traffic upon the plan previously agreed to by the great majority of the roads, with such additional changes and improvements as are above indicated. When the consent of the roads named in schedule "A" is secured, the details can be arranged through the committee of the passenger agents, under the instruction of the general managers. This seems to be the only method that can now be suggested to avoid further demoralization in the passenger traffic and to secure a reasonable compensation to the companies for the service they render.

To this is added a schedule giving a list of points between which the earnings and traffic should be divided, for which statistics are prepared. The roads to be parties to this agreement are: Baltimore & Ohio; Boston & Albany; Boston, Hoosac Tunnel & Western; Chicago & Atlantic; Chicago & Grand Trunk; Chicago, St. Louis & Pittsburgh; Cincinnati, Washington & Baltimore; Cincinnati, Indianapolis, St. Louis & Chicago; Cleveland, Columbus, Cincinnati and Indianapolis; Cleveland & Pittsburgh; Delaware, Lackawanna & Western; Delaware & Hudson Canal; Fitchburg Railroad; Grand Trunk; Indiana, Bloomington & Western; Indianapolis & St. Louis; Lake Erie & Western; Lake Shore; Lehigh Valley; Michigan Central; New York Central; New York, West Shore & Buffalo; New York, Pennsylvania & Ohio; New York, Lake Erie & Western; Ohio & Mississippi; Pennsylvania Railroad; Pittsburgh, Fort Wayne & Chicago; Pittsburgh, Cincinnati & St. Louis; Vandalia Line, and Wabash, St. Louis & Pacific.

TECHNICAL.

Locomotive Building.

Mr. H. B. La Rue having resigned his position as Traveling Agent of the Brooks Locomotive Works in Dunkirk, N. Y., to devote his entire attention to the increasing business of the Midvale Steel Co., Mr. R. J. Gross is appointed Traveling Agent. Resignation and appointment took effect Oct. 1.

The Baldwin Locomotive Works in Philadelphia are running for the present on short time, in order to keep their large force all employed.

Car Notes.

The Buffalo Car Co. in Buffalo, N. Y., is building 300 box cars for the Delaware, Lackawanna & Western road. They are to cary 20 tons each. The company has also closed a large contract for refrigerator cars for the Merchants' Dispatch.

The Missouri Car & Foundry Co. in St. Louis has nearly completed its contract for 750 box cars for the St. Louis & San Francisco road. It has on hand a large contract for repairing and rebuilding freight cars.

An order has been issued by Judge Fish at Fonda, directing E. Nott Schermerhorn, receiver of the Jones Car Works, Schenectady, N. Y., to offer for sale at public auction the company's real and personal property in one entire lot, at a sum not less than $85,000. The money realized from the sale of the property is to be deposited in the United States Trust Co. of New York city, until the questions now in litigation are settled.

A stock company has been organized in Allegheny, Pa., to build the Cordrey rotary dumping car, and the Eureka coal and ballast car on an extensive scale. It is proposed to lease the Gill Car Works in Allegheny.

Iron Notes.

The Pennsylvania Steel Co. at its recent annual meeting in Philadelphia re-elected the old officers and directors for the ensuing year, as follows: President, S. M. Felton; Secretary and Treasurer, E. F. Barker; Superintendent, Luther S. Bent; directors, Samuel M. Felton, Edmund Smith, William Matthews, H. H. Houston, Charlemagne Tower, William W. Spackman, of Philadelphia, and Francis Thompson, of Boston. After the meeting a prominent officer of the company said the outlook of the steel trade in Pennsylvania for the coming year is bright. The annual report shows that the past year was much better for the workmen than for the company. "We have had," he said, "plenty of orders, and have succeeded in keeping our workmen employed the year through. The prices received, however, were much lower than in former years, which materially lessened our profits. The demand for steel is now steadily on the increase, and we anticipate that the coming year will be a successful one, as far as work is concerned, although the stagnation of the money market will have the effect of keeping prices down."

The Cleveland Rolling Mill Co. in Cleveland, O., has made a general reduction of 10 per cent. in the wages of its workmen.

The Glendon Iron Co. at Easton, Pa., is preparing to put its No. 5 furnace in blast. No. 3 furnace will shortly go out of blast for repairs.

The Andover Iron Co. in Phillipsburg, N. J., has now all of its furnaces out of blast.

Monocacy Furnace at Monocacy, Pa., was sold at sheriff's sale Oct. 11, and was bought by the Philadelphia & Reading Co. for $19,500, subject to a mortgage of $105,000.

Wilton Furnace at Wilton, Va., on the Richmond & Allegheny road, is nearly finished and will soon go into blast. It is a coke furnace, and has been built by Mr. D. S. Cook, of Pennsylvania.

Manufacturing and Business Notes.

Hewes & Phillips, in Newark, N. J., recently delivered to the Cleveland Forge & Iron Co., in Cleveland, O., a slotting machine with 54 in. stroke.

The works of the United Brass Co., in Lorain, O., have been shut down for 90 days.

The Rail Market.

Steel Rails.—Fewer sales are reported but quotations continue higher, about $28.50@$29 per ton at mill being the latest figures. The *Iron Age* of Oct. 16 says: "The project for the restriction of steel-rail production, the prospects of which seemed quite flattering last week, has very probably come to naught. One of the companies would not agree to the proposition to run half-time, or on day turn only, during the first six months of 1885, for the reason that its contracts for deliveries of rails would be seriously interfered with, and arrangements had already been made for the receipt of the necessary materials. As the agreement of all the companies whose works are now in operation was essential to the success of the plan, this objection was fatal. The prospects now are that the companies will run their works to suit their individual conditions or necessities, either single or double turn, and that a few months hence, if business does not revive in the mean time, there will be another fierce competition for orders, with the possibility of some works stopping. Some large orders are now about to be placed by Eastern railroad companies which have been expected to come upon the market for some time, and, as they are regarded in the nature of options, it is very probable that they will be taken at the low rates prevailing some time ago, or about $27 at mill. It is claimed by the steel-rail companies that strictly new business will not enjoy these favorable rates, but only be taken at the enhanced prices which they are now in better position to demand than they were a short time ago."

Rail Fastenings.—The market continues dull and spikes quoted at $2 per 100 lbs. in Pittsburgh, track-bolts at $2.38 @$2.63 per 100 lbs. and splice-bars at 1.65@1.75 cents per pound. No large sales are reported.

The Union Car Coupler.

We are requested to state this coupler, which was illustrated in the issue of the *Railroad Gazette* for the 26th ult., is in use on 125 cars on the Eastern Railroad, and on 100 cars on the Boston & Maine, and is also used on the Boston & Providence and the Central Vermont.

The Massachusetts Car-Coupler Investigation.

The Massachusetts Railroad Commissioners, on Oct. 9, continued their work by witnessing tests of the Hilliard, the Williams, the Boston and the Janney couplers in the Fitchburg Railroad yard. They afterward saw tests of the United States coupler made in the Eastern Railroad yard in East Boston.

The Sharpsville *Advertiser*, of Oct. 8, says that Mr. John M. Goodwin had lately returned from Boston, where he attended the hearing before the Massachusetts Railroad Commission on car-coupling, when he urged that the whole question should be submitted to a committee of experts. The *Advertiser* says:

"In his opinion, the results of the investigation had at Boston will be very valuable in each of several directions. One of the most directly operative results is the development of the fact that no one of the couplers, now prominently before the railroad public, has all the qualities necessary to make it worthy of adoption as the standard coupler of the country."

Blast Furnaces of the United States.

The *Iron Age* says: "Herewith we present our regular quarterly report of the condition of the blast furnaces of the United States: In a condensed form the table presents the following condition of blast furnaces Oct. 1, 1884:

	In blast.		Out of blast.	
Fuel.	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal	69	8,669	175	16,318
Anthracite	86	23,539	141	32,460
Bituminous	79	40,410	146	52,136
Total	234	72,618	462	100,914

"As compared with the condition of the furnaces on July 1, a considerable shrinkage in production is apparent, there being 45 furnaces less in blast now than then, with 13,213 tons less weekly capacity. The shrinkage extends throughout the three classes of furnaces.

"In the following table a comparison is made between the condition of the furnaces on Oct. 1 a year ago and at the present time:

	No. in blast.		Weekly capacity.	
Fuel:	1883.	1884.	1883.	1884.
Charcoal	104	69	10,686	8 669
Anthracite	122	86	29,799	23,539
Bituminous	114	79	50.452	40,410
Total	340	234	90,937	72,618

"This table shows that there has been a diminution of over 31 per cent. in the number of active furnaces within a year, and a decrease of over 20 per cent. in productive capacity of the furnaces in operation. For the last seven years the relative condition of the furnaces on Oct. 1 has been as follows:

Furnaces in Blast Oct. 1.

	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Charcoal	83	97	153	153	158	104	69
Anthracite	88	128	143	148	157	122	86
Bituminous	80	112	128	134	128	114	79
Total	251	337	424	435	443	340	234

Furnaces out of Blast Oct. 1.

	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Charcoal	186	159	116	119	93	145	175
Anthracite	135	98	99	87	72	110	141
Bituminous	133	90	91	87	111	110	146
Total	454	347	303	293	276	365	462

"It will be noticed as a significant fact that fewer furnaces are now in blast than on Oct. 1, 1878."

The History of a Second-Hand Boiler.

The following story is told by *Engineering*: "A bought a second-hand boiler on speculation and stored it with B; not being able to stick any one on it in a year and a half, A gave the boiler to B for the storage charged. B sold the boiler to C for $50; C ran it for a while and sold it to D for $90, which was altogether too much profit. D seems to have had a little decency in him, for, after working the boiler a little while, he sold it to E for only $10 advance on what he paid for it. There is no knowing what price E would have got for it, because, fortunately, it burst on him."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Central Massachusetts, annual meeting, in the Boston & Lowell station in Boston, Oct. 29.

East Tennessee, Virginia & Georgia, annual meeting, at the office in Knoxville, Tenn., Nov. 12.

Evansville & Terre Haute, annual meeting, in Evansville, Ind., Oct. 20.

Manhattan, annual meeting, at the office in New York, Nov. 12, at noon.

Memphis & Charleston, annual meeting, in Huntsville, Ala., Nov. 13.

New York, Lake Erie & Western, annual meeting, at the office in New York, Nov. 25.

Philadelphia & Reading, annual meeting, at the office in Philadelphia, Jan. 12, 1885. The registry of stock closed October 12.

Rochester & Pittsburgh, annual meeting, at the office, No. 20 Nassau street, New York, Nov. 12.

Dividends.

Dividends upon the capital stocks of railroad companies have been declared as follows:

Concord, 5 per cent., semi-annual, payable Nov. 1, to stockholders of record on Oct. 11.

Mt. Washington, 10 per cent. from the earnings of the past year.

Pacific Mail Steamship Co., 1¼ per cent., quarterly, payable Nov. 1.

Master Car-Builders' Meeting.

A meeting of Master Car-Builders was held at the Tifft House, in Buffalo, Oct. 8 about 25 persons being present,

Mr. W. D. McWood presided, and Mr. J. S. Lentz acted as secretary.

The principal subject of discussion was the interchange of cars and the rules governing their condition, and views were exchanged on these points.

The committee appointed last spring to consider the question of forming a permanent car-builders' club with headquarters in Buffalo reported adversely to the plan.

It was resolved to hold the next meeting in Buffalo, Jan. 14 next. After adjournment the automatic coupler inventor put in an appearance and several models of couplers were examined.

New England Railroad Club.

The regular monthly meeting of this Club will be held at its rooms in the Boston & Albany passenger station in Boston, on Wednesday evening, Oct. 22, at 7:30 o'clock.

Subject for Discussion: "Is it possible to produce and regulate any system of heating and ventilating that will give general and uniform satisfaction, and should the two be combined?

Those familiar with the details of this subject are expected to be present and take part in the discussion.

The Executive Committee, to whom was referred the question of drawing up a constitution and by-laws, will submit their report at this meeting.

Interested parties are cordially invited to be present.

The Executive Committee will be glad to receive from members suggestions as to topics for consideration of the Club.

Railroad Conductors' Life Insurance Association.

The 17th annual meeting of this Association was held in Toronto, Ont., Oct. 8. The Executive Committee reported nearly 2,000 members in good standing. During the past year there were 14 deaths, and 15 applications were made for endowments on account of total disability, only four of which were allowed. No deaths or injuries to members have been reported since 1882 on account of the use of intoxicating liquor. This information is given on account of a resolution of inquiry offered by ex-President Sears at the convention last year. The Committee recommended that the Association define total disability, fix a limit as to the age of applicants for membership, and provide for the return of delinquent members upon a basis more in their favor than exists under the present arrangement.

The Association decided to make no change in regard to the claims for disability. The clause that provides for the suspension of members for non-payment of dues was suspended for a year, so as to give delinquents a chance to return to the Association.

It was decided to hold the next convention in Denver, Col., in October, 1885.

General Time Convention.

The General Time Convention met in Philadelphia, Oct. 9, with a full attendance. Mr. P. P. Wright occupied the chair and Mr. W. F. Allen was Secretary.

The time schedules for the winter were adopted without material change.

The Secretary reported that the proposed uniform code of train signals had received the approval of a large number of roads, which had agreed to adopt the code on Nov. 16, when the fall changes of time will be made, and that other roads will adopt the code at a later period.

Resolutions were passed looking to the adoption of a uniform code of telegraph signals and rules governing train movement.

The convention voted to pay the Secretary, Mr. W. F. Allen, the sum of $1,000 as some recognition of his services in securing the adoption of the standard time system.

A resolution was adopted, to be presented to the International Prime Meridian Conference now assembled at Washington, to the effect that the time based on the present 75th, 90th, 105th and 120th meridians was entirely satisfactory and a change would be inexpedient and unnecessary, involving much labor in readjusting it should a new prime meridian be adopted.

Southern Association of General Passenger and Ticket Agents.

A called meeting of this Association was held in Louisville, Ky., Oct. 9, President B. W. Wrenn presiding, with Mr. C. A. Taylor Secretary.

Officers for the ensuing year were elected, and it was decided to hold the spring meeting in Mobile.

It was decided to adopt the schedule of tourist passenger rates in force last winter, the only change made being the limitation of Jacksonville tickets to 15 days, instead of 30 as heretofore.

A rate of one cent per mile for round-trip tickets to Washington on the occasion of the completion of the Washington Monument, Nov. 25, was allowed. Other business of minor importance was disposed of and the Association adjourned.

New England Road-masters' Association.

The annual meeting of this Association began at White River Junction, Vt., Oct. 8, with a large attendance of members.

After an address by President Hyland several amendments were made to the by-laws and constitution, one of which provided for the admission to membership of road-masters for the British provinces. In the afternoon the enrolment of new members took place. The following-named officers were then elected for the ensuing year: President, C. A. Bean, Central Vermont; Vice-President, J. W. Shanks, New London Northern; Secretary, W. F. Ellis, Providence & Worcester; Treasurer, P. A. Eaton, Concord; Executive Committee, J. K. Hatch, Connecticut River, J. S. Lane, New York, New Haven & Hartford, and A. C. Stevens, Eastern.

The election of officers was followed by discussions of the following questions: First, footguards, best form for the safety of employés at frogs, switches and guard rails; second, the relation of a section of rails to car wheels as regards flangeway at frogs and switches; third, frogs and switches; fourth, joints.

The evening session was devoted to the exhibition by manufacturers' agents of new devices, including clawbars, angle joints, track-drills, track gauges, fish-plate, springs, nut-bolts, track-jacks; also, discussion relating to the best form and weight for rails, etc.

On the second day it was resolved to hold the next annual meeting at Springfield, Mass., the second Wednesday in October, 1885, commencing at 2 p. m. on that day, and closing at noon on the Friday following. A proposition to admit civil engineers connected with the roads represented in the Association was tabled. The by-laws were amended, making the annual dues $2.50 in the future.

The usual votes of thanks, etc., were passed, and at 2 p. m. the convention adjourned until October 1885.

ELECTIONS AND APPOINTMENTS.

American Society of Civil Engineers.—At the monthly meeting, Oct. 1, the following candidates were chosen members: Charles A. Marshall, Johnstown, Pa.; Burr K. Field, Philadelphia; Robert I. Sloan, New York.

Brooks Locomotive Works.—Mr. R. J. Gross has been appointed Traveling Agent in place of H. B. LaRue, resigned.

Brotherhood of Locomotive Engineers.—At the convention in San Francisco last week Mr. E. S. Ingraham was re-elected First Grand Engineer, and Mr. J. R. Sprague, of Toronto, Ont., was chosen Second Grand Engineer. Mr. Ingraham now enters upon his twelfth consecutive year in his office.

Chicago & Eastern Illinois.—At the annual meeting in Chicago, Oct. 7, the following directors were elected: For three years, Franklin H. Storey, E. F. Leonard, and J. G. English; for one year, E. Morton, vice R. A Gambrill, resigned. The officers were all re-elected as follows: President, H. H. Stevens; Vice-President, George H. Ball; Secretary, A. S. Dunham; Treasurer, J. C. Calhoun.

Cincinnati, Van Wert & Michigan.—The directors have chosen officers for the ensuing year as follows: President, Grinnell Burt; Secretary, John Saver; Treasurer, Richard Smith; Assistant Treasurer, Wm. H. Pennell; General Manager, E. Garrison; Superintendent, D. R. Eonis; General Freight and Passenger Agent, E. M. Reynolds.

Evansville, Seymour & Bellefontaine.—The following officers were chosen at a meeting held in Seymour, Ind., Oct. 7: President, Robert Pattison; Vice-President, J. N. McBeth; Secretary and Treasurer, A. W. Carpenter.

Gulf, Colorado & Santa Fe.—At the annual meeting in Galveston, Tex., Oct. 7, the old directors were re-elected as follows: George Sealy, R. S. Wells, Walter S. Davis, H. Kempner, John D. Rogers, H. Rosenberg, J. E. Wallis, Leo Blum, S. Heidenheimer, Walter Gresham, W. L. Moody. The vacancies caused by the death of John Sealy and the resignation of Percy R Pyne were not filled, thus reducing the membership of the board from 13 to 11.

Hannibal & St. Joseph.—Mr. Norman Paradise has been appointed Master Mechanic, with office at Hannibal, Mo., in place of James H. Long, resigned. Mr. Paradise was recently on the Chicago, Burlington & Quincy road. Mr. Thomas Johnson, recently in the Aurora shops of that road, has been appointed General Foreman of the Hannibal shops.

Indianapolis, Decatur & Springfield.—At the annual meeting in Indianapolis, Oct. 9, the following directors (one-fourth of the board) were chosen for four years: C. F. Leonard, Springfield, Ill.; E. R. Andrews, H. B. Hammond, S. S. Sands, New York. The road is leased to the Indiana, Bloomington & Western Company.

Joliet, Aurora & Northern.—The following officers have been elected for this company: President, D. Newton, Holyoke, Mass.; Secretary, E. Wood, Plainfield, Ill.; Treasurer, B. H. Evans, Aurora, Illinois.

Lake Erie & Western.—At the annual meeting in Bloomington, Ill., Oct. 8, the following directors (one-third of the board) were chosen for three years: Calvin S. Brice, Lima, O.; Wm. N. Fliess, H. R. Lyman, Alexander M. White, New York. The only new director is Mr. Fliess, who succeeds Mr. Daniel P. Eels.

Mexican Central.—At a meeting of the board in Boston, Oct. 11, Isaac T. Burr resigned as President, and Levi C. Wade (late First Vice-President) was unanimously elected to the presidency. The organization of the company is now as follows: Directors, Levi C. Wade, Isaac T. Burr, Benjamin P. Cheney, A. W. Nickerson, C. T. Paine, Thomas Nickerson, George B. Wilbur, A. B. Lawrie, Jacob Edwards, Warren Sawyer, William Rotch, Oliver Ames, Boston; Arthur Sewall, Bath, Me.; Levi Z. Leiter, Chicago; Robert R. Symon, London; D. B. Robinson, Sebastian Camacho, Enrique M. Rubio, Miguel Auza, Mexico. Officers, Levi C. Wade, President; Robert R. Symon, Vice-President; S. W. Reynolds, Clerk and Treasurer; J. H. Goodspeed, Auditor; D. B. Robinson, General Manager. Finance Committee, B. P. Cheney, J. T. Burr, C. J. Paine, Warren Sawyer, Jacob Edwards.

Minneapolis & St. Louis.—At the annual meeting in Minneapolis, Minn., Oct. 7, the following directors (one-third of the board) were re-elected for three years: J. D. Springer, Minneapolis; David Dows, H. R. Bishop, New York. The board re-elected the old officers, as follows: President, R. R. Cable; Vice-President, W. H. Truesdale; Secretary and Treasurer, Joseph Gaskell; Executive Committee, R. R. Cable, H. H. Porter, W. D. Washburn and H. R. Bishop.

Missouri Pacific.—Mr. J. F. McDougall has been appointed Train-master of the Missouri, Kansas & Texas Division, with office at Moberly, Mo., in place of W. H. Hartman, resigned.

Mr. D. Hardy has been appointed Train-master of the Central Branch Division. Mr. W. H. Peters succeeds Mr. Hardy as Chief Train Dispatcher.

New England Road-masters' Association.—At the annual convention at White River Junction, Vt., Oct. 8, the following officers were elected for the ensuing year: President, C. A. Bean, Central Vermont; Vice-President, J. W. Shanks, New London Northern; Secretary, W. F. Ellis, Providence & Worcester; Treasurer, P. A. Eaton, Concord; Executive Committee, J. K. Hatch, Connecticut River; J. S. Lane, New York, New Haven & Hartford, and A. C. Stevens, Eastern.

New York Lake Erie & Western.—Mr. Wm. Parsons, Jr., has been appointed Road-master of the Susquehanna Division, with headquarters at Elmira, N. Y. He was recently Road-master of the New York & Greenwood Lake road.

Northern Pacific.—The new board has re-elected the old officers as follows: President, Robert Harris; Vice-President and General Manager, Thomas F. Oakes; Secretary, Samuel Wilkeson; Treasurer, R. Lenox Belknap.

Ohio & Mississippi.—At the annual meeting in Cincinnati, Oct. 9, the following directors were chosen: F. W. Tracy, James Sloan, Jr., E. Higgins, Jr. This was the Baltimore & Ohio ticket. The opposition applied at once for a writ of *quo warranto*, on the ground that the election was decided by the votes of the Springfield Division bond-holders, who, they claimed, were not entitled to vote.

Peoria, Decatur & Evansville.—Mr. C. E. Keyes has been appointed Road-master of the Pekin & Mattoon Division in place of J. E. Miller, resigned.

Profile & Franconia Notch.—At the annual meeting in Concord, Oct. 8, the following directors were chosen: Walter Aiken, Franklin, N. H.; Edward Spaulding, Nashua, N. H.; Samuel N. Bell, Manchester, N. H; John H. George, John A. White, Concord, N. H.; Isaac S. Craft, Emmons Raymond, J. Thomas Vose, Boston. The board elected Emmons Raymond President; Samuel N. Bell, Clerk.

Railroad Conductors' Life Insurance Association.—At the annual meeting in Toronto, Ont., Oct. 11, the following officers were elected: President, E. Worrell, Pittsburgh, Cincinnati & St. Louis; Vice-Presidents, Samuel Defries, John W. Oliver; Grand Secretary and Treasurer, H. P. Feltrow; Executive Committee members, J. O. Beecher, three years, and Wm. Sense, one year; Orator, Eugene McKenna.

St. Louis & San Francisco.—Mr. A. T. Mann, Jr., has been appointed Purchasing Agent in place of Mr. A. G. Thompson, resigned.

St. Louis, Topeka & Northwestern.—This company has been organized with the following directors: John T. Francis, M. T. Sullivan, J. G. Stonaker, Topeka, Kan.; Joel Moody, Mound City, Kan.; F. Eggers, Appleton, Mo.; Chester Bullock, New York. The board elected John T. Francis President; M. T. Sullivan Secretary; F. Eggers Treasurer.

Southern Association of General Passenger & Ticket Agents.—At the meeting held in Louisville, Ky., Oct. 9, the following officers were chosen: President, J. L. Taylor, Savannah, Florida & Western; Vice-President, T. M. Emerson, Atlantic Coast Line; Secretary, C. A. Taylor, Richmond, Fredericksburg & Potomac.

Southern Central.—Mr. E B. Burnham has been appointed General Car Agent of this Company, taking effect Oct. 1. All communications pertaining to cars and reports of car service, should be sent to him at Auburn, New York.

Texas & St. Louis.—Mr. W. N. Marshall is appointed Assistant to the General Superintendent, with headquarters at Pine Bluff, Ark. He was recently on the Louisville, New Albany & Chicago road, and is President of the Train Dispatchers' Association.

Western & Atlantic.—The appointment of Mr. Lamar (noted last week) to succeed the late Mr. Flynn is as Master Mechanic only. Mr. Wm. Kinyon, for 10 years past Foreman of the car shops in Atlanta, has been appointed Master Car-Builder of the road.

Western Maryland.—At the annual meeting in Baltimore, Oct. 15, the following directors were chosen: Joshua Biggs, George W. Harris, C. W. Humrichhouse, J. K. Longwell, Edward Worthington. The other eight directors are appointed by the city of Baltimore.

PERSONAL.

—Mr. W. H. Hartman has resigned his position as Train-master of the Missouri, Kansas & Texas road.

—Mr. A. G. Thompson has resigned his position as Purchasing Agent of the St. Louis & San Francisco road.

—Mr. James H. Long has resigned his position as Master Mechanic of the Hannibal & St. Joseph Railroad.

—Mr. F. Tufts has resigned his position as Assistant Superintendent of the Central Branch Division of the Missouri Pacific road.

—Mr. Isaac T. Burr has resigned his position as President of the Mexican Central Co. He has held the office for a short time only, succeeding Mr. Thomas Nickerson in July last.

—Mr. Payson Tucker, General Manager of the Eastern and the Maine Central roads, sailed from Boston Oct. 11, on a short trip to Europe for rest and for the benefit of his health.

—Gen. Samuel Thomas announces that he will withdraw from the presidency of the East Tennessee, Virginia & Georgia Co. at the annual meeting next month. This will not, however, involve any change in the control or management of the road.

—Mr. Robert Neilson has declined the position of Vice-President of the Philadelphia & Reading Co., which was recently offered to him. It is stated that Mr. Neilson asked for certain guarantees which the company was not able to give, and that he accordingly preferred to retain his present position on the Pennsylvania Railroad.

—Hon. John P. King is living in retirement in Augusta, Ga., and is still well and active, in spite of his advanced age. Mr. King was United States Senator from Georgia so long ago that men of the present day forget that he ever held political office; but he is chiefly known as having been for more than a generation President of the Georgia Railroad & Banking Co. He held that office so long that when Gen. Alexander was at last chosen in his place, it must have seemed to many of the old holders of stock as if the company itself must pass away. Mr. King was always strongly opposed to the consolidation of lines and the ownership of extensive systems by one company, holding that the true railroad policy was the building of lines of moderate length, to be owned and operated by distinct companies. His policy has not prevailed, however, and the road of which he was the manager so many years has itself become by lease part of the system of two greater companies.

TRAFFIC AND EARNINGS.

The Colorado and Utah Pools.

A dispatch from Chicago, Oct. 12, says: "Telegrams were received in this city yesterday from the presidents of all the roads interested in ratifying the formation of the Colorado and Utah pools as outlined at a recent meeting in this city. This makes certain the maintenance of rates, at least until Jan. 1, 1885. The telegrams provided that the percentages should be determined by the arbitration of J. F. Tucker, and that his decision should be final."

Chicago & Pacific Coast Fast Freight Line.

This line has been organized by the Chicago, Burlington & Quincy and the Atchison, Topeka & Santa Fe as a fast freight line with daily through trains from Chicago to San Francisco, carrying freight for all points in California, New Mexico and Arizona, on or reached by the Atchison, Topeka & Santa Fe and the Southern Pacific roads.

The trains will be composed of new cars, built expressly for the trade, and equipped with the Westinghouse automatic air-brakes. It is expected that the trains will run through from Chicago to San Francisco in nine days. The first train left Chicago Oct. 13. A connecting train runs from St. Louis over the Chicago & Alton.

Passenger Rates to Missouri River Points.

The cutting of rates from Chicago to Missouri River points continues, and the competition is so sharp that on Oct. 14 tickets were sold from Chicago to Kansas City for $1, and to Council Bluffs for $1.10. The tickets are sold nominally at full rates, but passengers receive on arrival a rebate, which brings the price down to the figures named.

Rates from Chicago to St. Louis are not openly cut, but tickets have been sold at the brokers' offices as low as $2, and the cutting is all done in this way.

No steps have as yet been taken to bring about a settlement of these troubles or a restoration of rates.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1884.	1883.	Inc. or Dec.	P.c.
Nine months ending Sept. 30:				
Bur., C. R. & N..	$1,952,462	$1,969,724	D. $17,262	0.9
Boston, Hoosac Tun & W.....	328,196	248,837	I. 79,359	31.9
Central Pacific ..	16,678,164	18,275,232	D. 1,597,068	8.7
Ches. & Ohio....	2,689,994	2,879,284	D. 189,290	6.6
Ches., O. & S. W..	958,977	915,178	I. 43,799	4.8
Chi. & W. Mich..	1,136,840	1,168,169	D. 31,329	2.7
Cin., W. & Balt ..	1,288,278	1,420,082	D. 131,804	9.3
Cleve., Ak. & C ..	361,365	399,804	D. 38,439	9.6
Eliz., Lex. & B. S.	557,507	538,828	I. 18,679	3.5
Ev. & T. Haute..	567,003	546,930	I. 20,073	3.6
Flint & Pere M..	1,733,773	1,860,844	D. 127,071	6.8
Fla. Ry. & N. Co.	704.155	649,027	I. 55,128	8.5
Ft. Worth & D..	355,212	268,581	I. 86,631	32.2
Grand Trunk....	12,460,218	13,944,471	D. 1,484,253	10.6
G. B., W. & St. P..	238,750	280,552	D. 41,802	14.9
Houston, E. & W. Tex	194,486	228,909	D. 34,423	15.0
Ill. Central.....	7,209,751	7,714,983	D. 505,232	6.5
Iowa lines	1,203,538	1,453,583	D. 250,045	17.2
Kentucky Cent..	607,336	619,879	I. 47,457	7.7
Kansas City, Ft. Scott & Gulf...	1,734,637	1,377,982	I. 356,656	26.0
Kan. City, Spr. & Mem.....	830,488	.....	.....	...
Marq., H. & O..	706,215	691,729	I. 14,486	2.1
Mexican Central.	2,092,511	1,408,528	I. 683,983	48.5
Mobile & Ohio...	1,403,689	1,440,096	D. 36,427	2 5
Ohio Southern...	330,343	259,028	I. 71,315	27.5
St. L., A. & T. H.:				
Main Line	967,383	1,074,891	D. 107,508	10.0
Belleville Line.	543,249	601,352	D. 58,103	9.7
St. L., Ft. Scott & Wichita.....	353,951	172,651	I. 181,300	104 8
Wisconsin Cent..	1,040,898	1,036,013	I 10,885	1.1
Eight months ending Aug. 31:				
Bur., C. R. & No.	$1,691,303	$1,709,368	D. $18,065	1.1
Net earnings...	455,448	457,091	D. 1,643	0.3
Ches. & Ohio....	2,380,331	2,513,813	D. 133,482	5.3
Net earnings...	707,773	824,145	D. 116,372	14.1
Ches., O. & S. W.	842,513	784,241	I. 58,272	7.4
Net earnings...	165,055	147,296	I. 17,759	12.1
Des M. & Ft. D..	214,121	198,428	I. 15,693	7.9
Net earnings...	55,118	42,869	I. 12,249	28.7
Eliz., Lex. & B. S.	480,980	455,893	I. 25,087	5.5
Net earnings...	147,805	129,520	I. 18,285	14.1
Ft. Worth & D..	317,212	226,192	I. 91,020	40.3
Net earnings...	137,309	.....	.....	....
Kentucky Cent..	577,263	528,725	I. 48,538	9.2
Net earnings..	199,081	220,380	D. 21,299	9.7
L. Rock & Ft. S..	306,902	312,388	D. 5,480	1.7
L. R., M. R. & T.	201,058	234,588	D. 33,530	14.5
Louisv. & Nash..	8,733,662	8,751,286	D. 17,624	0.2
Net earnings...	3,172,696	3,437,439	D. 264,743	7.7
N.Y., L. Erie & W.	13,117,365	14,859,875	D. 1,742,510	11.7
Net earnings...	2,617,893	4,477,979	D. 1,860,086	41.5
Northern Pacific.	8,040,626	5,424,908	I. 2,615,718	41.8
Net earnings...	3,261,458	1,376,241	I. 1,885,237	137.0
Rome, W. & Og..	1,073,206	1,049,653	I. 23,552	2.2
Tol., Ann Arbor & G. T.....	144,904	122,849	I. 22,055	18.0
Utah Central....	657,020	753,104	D. 95,484	12.7
Net earnings...	280,173	381,155	D. 100,982	27.2
Month of August:				
Bur., C. R. & N.	$216,590	$232,521	D. $15,931	6.8
Net earnings...	55,027	73,636	D. 17,009	23.3
Ches. & Ohio....	348,187	381,746	D. 33,559	8.8
Net earnings...	141,962	160,747	D. 18,785	11.7
Ches., O. & S. W..	122,868	124,519	D. 1,651	1.3
Net earnings...	45,741	39,837	D. 5,904	14.8
Des M. & Ft. D..	34,452	36,796	D. 2,243	6.3
Net earnings...	13,056	18,219	D. 5,163	28.6
Eliz., Lex. & B. S.	83,172	75,831	I. 7,341	9.7
Net earnings...	40,087	40,265	D. 178	0.4
Ft. Worth & D...	37,212	31,269	I. 5,943	19.2
Net earnings...	19,390	7,897	I. 11,493	145.5
Kentucky Cent...	104,501	102.165	I. 2,336	2.3
Net earnings...	53.048	56,731	D. 3,683	6.4
L. Rock & Ft. S..	37,138	37,927	D. 789	2.1
L. R., M. R. & T..	24,705	24,172	I. 533	2.2
Louis. & Nash...	1,117,313	1,251,127	D. 133,814	10.7
Net earnings...	482,982	534,984	D. 52,002	9.6
N.Y., L. Erie & W.	1,861,214	2,580,956	D. 719,742	28.0
Net earnings...	640,176	1,100,065	D. 459,889	41.8
No. Pacific.....	1,032,602	1,043,624	D. 11,022	1.1
Net earnings...	423,539	391,354	I. 32,185	8.3
Oregon & Cal	80,280	81,057	D. 777	0.9
Net earnings...	8,464	18,592	D. 10,128	54.5
Rome, W. & Og..	176,353	171,406	I. 4,947	2.9
Tol., Ann Arbor & G. T.....	22,895	20,263	I. 2,632	12.9
Utah Central....	93,980	93,586	I. 394	0.4
Net earnings...	51,963	47,087	I. 4,876	10.4
Month of September:				
Bur., C. R. & No.	$261,159	$260,357	I. $802	0.3
Boston, Hoosac Tun. & W.....	46,737	34,794	I 11,943	34.1
Central Pacific...	2,268,000	2,426,348	D. 158,348	6.5
Ches. & Ohio....	306.365	365,471	D. 59,106	16.2
Ches., O. & S. W.	116,464	130,927	D. 14,473	11.0
Chi. & W. Mich..	119,825	142,016	D. 22,191	15.6
Cin., W. & Balt..	184,016	215,092	D. 31,076	14.5
Cleve., Ak. & Col.	46,587	54,109	D. 7,522	13.9
E., Lex. & B. S...	76,307	82,935	D. 6 628	8.0
Ev. & T. Haute..	76,774	67,054	I. 9,720	14.5
Flint & Pere M..	172,558	204,863	D. 32,305	15.7
Fla. Ry. & N. Co.	69,737	74,758	D. 14,021	18.7
Ft. W. & Denver.	38,000	42,389	D. 4,389	10.4
Grand Trunk	1,480,934	1,663,345	D. 182,411	10.9
G. B., W. & St. P.	25,112	33,027	D. 7,915	24.0
Houston, E. & W. Tex.....	20,932	28,968	D. 8,036	27.7
Illinois Central...	887.982	1,045,902	D. 157,920	15.1
Iowa lines.....	160,861	201,907	D. 41,046	20.3
Kentucky Cent..	100,598	91,155	I. 9.443	10.4
Kansas City, Ft. Scott & Gulf..	206,750	195,021	I 11,729	6.0
Kan. City, Spr. & Mem	93,236	.....	.....	...
Marq., H. & Ont.	102,531	128,804	D. 26,273	20.3
Mexican Cent....	249,954	153,748	I. 96,206	62.5
Mobile & Ohio...	158,585	185,902	D. 27,317	14.5
Ohio Southern...	46,384	38,667	I. 7,617	19.8
St. L., A. & T. H.:				
Main Line	116,429	141,793	D. 25,364	18.0
Bellev.lle Line.	62,029	80,732	D. 18,703	23.1
St. L., Ft. S. & W.	46,404	32 340	I. 14.064	43.7
Wis. Central....	112,684	119,679	D. 6,995	5.8
First week in October:				
Canadian Pac....	$165,000	$131,000	I. $34.000	26.0
Chi. & Alton	223,853	225,402	D. 1,549	0.7
Chi. & East. Ill..	40,656	28,738	I. 11,918	41.1
Chi., Mil. & St. P.	555,0.0	539,428	I. 15,572	2.9
Chi. & Nor'west..	533,400	607,800	D. 74,400	12.2
C., St. P., M. & O.	131,900	133,800	D. 1,900	1.4
Det., Lan. & No..	26,126	33,247	D. 7,121	21.5
Louisv. & Nash..	277,905	325,870	D. 47,965	14.7
Mil., L. S. & W..	21,450	21,140	I. 310	1.5
Mil. & Northern..	11,165	10,340	I. 825	8.0
North. Pacific....	304,774	376,400	D. 71,626	14.8
Roch. & Pitts....	24,809	17,020	I. 7,789	45.8
St. L. & San Fran.	105,300	80,500	I. 24,800	30.8

Weekly reports of earnings are usually estimated in part, and are subject to correction by later statements.

Southern Railway & Steamship Association.

The arbitrators (Messrs. John Screven, Thomas H. Carter and E. K Sibley) have made their award in the case of cotton divisions at Montgomery, Ala. The case was heard in St. Louis, Oct. 6, and the division is as follows: Louisville & Nashville, 42 per cent.; Western, of Alabama, and the Montgomery & Eufaula, 36; East Tennessee, Virginia & Georgia, 22 per cent. This award takes effect from Sept. 1, in accordance with the resolution of the Executive Committee.

In the matter of cotton divisions at Selma, Col. G. Jordan, who was specially chosen as arbitrator in the case, makes the following award: Montgomery & Eufaula and the Western, of Alabama, 20 per cent.; Louisville & Nashville, 12; Cincinnati, Selma & Mobile, 21; East Tennessee, Virginia & Georgia (*via* Calera), 9½; East Tennessee, Virginia & Georgia, 37½ per cent. It is recommended that this division take effect from Oct. 15.

Grain Movement.

For the week ending Oct. 4, receipts and shipments o grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past nine years:

Year.	North-western receipts.	Northwestern shipments. Total.	By rail.	P. c. By rail.	Atlantic. receipts.
1876	6,161,195	4,366,720	1,835,991	42.1	3,718,853
1877	5,619,469	5,386,512	1,030,797	19.1	5,742,967
1878	5,698,266	5,089,892	1,245,545	24.5	7,343,525
1879	7,671,299	6 841,969	1,817,672	26.6	7,894,596
1880	9,214,924	6,693,430	1,772,487	26.5	6,158,528
1881	6,058,767	3,249,565	1,995 000	61.4	4,467,460
1882	5,602,587	4,345,960	1,516,559	34.9	4,049,039
1883	8,015,530	5,570,213	2,371,985	42.6	4,757,555
1884	8,685,026	5,944,810	2,509,476	42.2	4,369,243

Thus the receipts of the Northwestern markets for the week this year were 670,000 bushels more than in the corresponding week of last year, and larger than in any other year except 1880. They were also 427,000 bushels more than in the previous week of this year and the largest of the year. They were exceeded last year in each of the four weeks from Aug. 26 to Sept. 23. The increase over the previous week was at Chicago and Detroit, and at Chicago was wholly corn, this week having two days of the September corn corner. More than 90 per cent. of the corn receipts of the week were at Chicago, which had 84 per cent. the week before (when the high prices of the corner were drawing corn), 80½ in the week to Sept. 20, 77½ in the week to Sept. 13, and 77¾ in the week to Sept. 6.

The shipments of these markets for the week were 374,600 bushels more than in the corresponding week of last, and more than in any other week since 1880, but less than in 1880 and 1879. They were 774,000 bushels more than the week before, and with the two exceptions were the largest of the year. The rail shipments were larger than in any previous year, but very little more than the week before this year. The shipments in both weeks were probably nearly all made at much less than the regular rates. The shipments down the Mississippi were only 12,250 bushels.

The receipts of the Atlantic ports for the week were 388,000 bushels *less* than last year, 320,000 *more* than 1882, but less than in any other year since 1876. They were 315,000 bushels less than in the previous week of this year.

Exports from Atlantic ports for this week to Oct. 4 have been:

	1880.	1881.	1882.	1883.	1884.
Flour, bbls.	131,592	97,150	167.994	148,366	133,363
Grain, bu..	5,138,153	2,272,109	3,347,677	2,718,868	1,613,145

Thus the exports were much less this year than in any other of the four.

San Francisco exports for the three months of the California crop year from July 1 to Sept. 30 were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

	1884.	1883.	Inc. or Dec.	P. c.
Flour	263,358	264,181	D. 823	0 3
Wheat	5,581,642	5,470,455	I. 111,187	2 0
Total, bushels..	6,898,432	6,791,360	I. 107,072	1.6

Exports of California barley by sea for the three months of the crop year to Sept. 30 were 178,070 centals, as compared with 65,649 centals for the corresponding period last year, showing an increase of 112,421 centals, or 171.2 per cent.

Coal.

Coal tonnages for the week ending Oct. 4 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite	70,478	701,524	D. 631,046	89.9
Eastern bituminous	203,085	197,492	I. 5,593	2.8
Coke	42,238	59,792	D. 17,544	29.2

The week was one of complete stoppage for the anthracite companies. Nearly all the shipments reported were for the Pennsylvania Railroad, which does not join in the agreement. It is reported that mining is to be stopped for one week in November and two weeks in December.

Cumberland shipments continue large, while the Clearfield tonnage for the week was the largest ever shipped from that district in one week.

The coal tonnage of the Pennsylvania Railroad for the week ending Oct. 4 was:

	Coal.	Coke.	Total.
Line of road	155,831	38,174	194,005
From other lines	58,191	4,064	62,255
Total	214.022	42,238	256,260

The total tonnage this year to Oct. 4 was 10,002,945 tons, against 9,141,755 tons to the corresponding date last year, an increase of 861,190 tons, or 9.4 per cent.

Cumberland coal shipments for the week ending Oct. 11 were 72,854 tons; the total shipments this year to Oct. 11 were 2,213,526 tons, against 1,918,771 tons to the corresponding date last year, an increase of 294,755 tons, or 15.4 per cent.

Cotton.

Cotton movement for the week ending Oct. 10 is reported as follows, in bales:

	1884.	1883.	Inc. or Dec.	P. c.
Interior markets:				
Receipts	109,840	143,291	D. 33,451	23.4
Shipments	91.229	115,912	D. 24,683	21.3
Stock, Oct. 10.	68,108	164,915	D. 96,807	58.7
Seaports:				
Receipts	205,313	228,897	D. 23,584	10.3
Exports	115.138	74,083	I. 41,055	55.6
Stock, Oct. 10	361.194	515,238	D. 154,044	30.5

The total movement from plantations for the cotton year (from Sept. 1) to Oct. 10 is estimated at 722,243 bales; the decrease, as compared with last year, is 156,616 bales, the decrease, as compared with 1882, is 85,603 bales, and with 1881, 275,432 bales.

New York & Brooklyn Bridge.

The receipts of the New York & Brooklyn Bridge for the month of September were as follows:

	Number.	Amount.
Foot passengers	341,000	$3,410
Car passengers	710,220	35,511
Teams	96,352	6,022
Miscellaneous	14	
Total		$44,937

The total number of passengers passing over the bridge was thus 1,051,220 during the month, exclusive of those carried over by teams. The expenses for the month were: Foot promenade, $3,933; carriageway, $3,218; railroad, $26,612; total, $33,763. The average number of passengers daily was 11,367 on foot and 23,674 in the cars, a total of 35,041.

Lake and Canal Rates in September.

The Buffalo *Commercial Advertiser* of Oct. 13 says: "The following are the average rates by lake from Chicago to Buffalo on wheat and corn, and the average on the same cereals from Buffalo to New York by canal for September in the years named:

	Canal— Wheat. Cents.	Canal— Corn. Cents.	Lake— Wheat. Cents.	Lake— Corn. Cents.
1884	2.2	1.9	4.7	4.2
1883	4,5	4.2	6.3	5.9
1882	2.4	2.2	5.8	5.2
1881	3.2	2.9	4.8	4.3
1880	4.4	3.9	5.9	5.3
1879	5.3	4.8	8.1	7.4
1878	4.4	4.1	8.0	7.1
1877	4.0	3.4	7.7	6.7
1876	2.6	2 2	6.2	5.6
1875	2.4	2.2	7.0	6.5
1874	3.5	3.2	9.5	8.5

The prostration in freights continues without material change. The dullness is not due so much to light grain shipments as to stagnation in the ore and coarse-freight trades. Tonnage that should be engaged elsewhere is forced into grain-carrying, causing excess of tonnage."

California Through Freights.

Shipments of through freight eastward from California points by rail in July were as follows:

	1884 Tons.	1884 Per ct.	1883 Tons.	1883 Per ct.
Central Pacific	10,714	89.8	8,649	64.0
Southern Pacific	1,214	10.2	4,870	36.0
Total	11,928	100.0	13,519	100.0

A notable feature of the month was the unusually small tonnage over the Southern Pacific. Of the total shipments this year 8,268 tons were from San Francisco and 3,660 tons were from interior points. Leading items of freight were 2,659 tons sugar, 1,419 tons tea, 1,176 tons wool and 482 tons wine.

West-bound Passenger Business.

The withdrawal of the Baltimore & Ohio from the trunk lines passenger pool is noted elsewhere.

A meeting of the trunk line passenger agents was held in New York, Oct. 14, at which the question of the disposition to be made of the Baltimore & Ohio's share of the immigrant business was discussed. That company had 6½ per cent. of this business from New York under the agreement. It was finally decided to have a new division made by arbitration the companies to submit their statements by Nov. 1.

RAILROAD LAW.

Condemning Lands—Damages for Trespass.

In the case of Swinney against the Pittsburgh, Fort Wayne & Chicago Co., the Indiana Supreme Court holds as follows:

The facts in this case were that the railroad company undertook to condemn certain lands, and had appraisers appointed and paid into court the amount found by them. Exceptions were taken to the finding of the appraisers and a judgment rendered for a greater sum. From this an appeal was taken to the Supreme Court. When the cause was remanded to the court below the railroad company, over objections, dismissed its proceedings to condemn. During this time the company had used large quantities of sand and gravel from the land, and this action is for trespass and damages, and damages for the conversion of the sand and gravel. When causes of action belong to the same class and are between the same parties, and also inure to the benefit of the plaintiff in the same right, they may be joined. Damages occurring to the owner of real estate for a trespass committed in his life time, constitute a chose in action in the hands of his executor or administrator. Where it was averred in a complaint that the land was devised to the plaintiff to be used and disposed of by him for certain specific purposes, such devise gives the executor the right to sue for damages to the land, so long as he remain executor under the will, unless sooner disposed of by him. The provision of the statute, sec. 397, allowing a railroad company to take possession of land where there has been a preliminary assessment of damages, amounts to a license for it to enter and continue in possession of the land pending the litigation. This license is granted on the condition that the railroad will proceed in good faith, and without unnecessary delay to have the amount which it would be required to pay for the land ascertained and finally established, and that it would within a reasonable time thereafter pay to the owner the amount thus finally established. Like all licenses this license may be revoked by abuse where the company had a preliminary assessment of damages, entered on the land and used the same while the litigation was pending and after having used the land dismisses its proceedings to have a determination of the amount of damages—such action constitutes an abuse of the statutory license and makes the company a trespasser *ab initio*. When a railroad company has taken possession of land under a preliminary proceeding for the assessment of damages and dismisses its action, in an action against it, for trespass and damages committed while it held the land during the pendency of the litigation, it will not be permitted to plead the statute of limitation as against such time as it held the land by virtue of the pending litigation. In such an action as this the amount of interest or its equivalent may be added to the damages.

Damages for Personal Injury.

In the case of Senn against the Central Railroad & Banking Co., the Georgia Supreme Court holds as follows, reversing the decision of the lower court against the company:

1. In an action for damages, brought by a passenger against a railroad company, for injuries which plaintiff sustained by the car on which she was a passenger running off the track, which was alleged to have been caused by the carelessness and negligence of the company in the construction of its track and the running of its cars, the plaintiff, being introduced as a witness in her own behalf, should not be allowed to state how much, in her opinion, was her loss by her inability to labor. The witness cannot give an opinion as to the amount of the damages, but must state facts, and let the jury say from the facts what is the amount of the damages.

2. Upon the trial of such a case, any witness may give an opinion as to what caused the train to run off the track, provided the witness states the reasons upon which the opinion is predicated. One who is an expert may give an opinion without stating his reasons.

3. It is a general rule that wherever an expert can give an opinion without the reasons upon which it is based, any other witness, who knows facts upon which he can form an opinion, may state his opinion by giving the facts upon which he bases his opinion.

4. In an action against a railroad company for damages to the plaintiff, caused by the car upon which she was a passenger running off the track, and where damages are

claimed both for physical pain and suffering from wounds received by her, and also on account of loss of business and inability to labor, it is error for the court to charge the jury in the following language, without any qualification: "In some torts the entire injury is to the peace, happiness and feelings of the plaintiff. In such cases no measure of damages can be prescribed, except the enlightened conscience of impartial jurors."

OLD AND NEW ROADS.

Alabama Railroad Projects.—The following notices of organization have recently been filed in Alabama:

Anniston & Cincinnati, proposed line from Anniston to Gadsden and Attalla. Incorporators, R. B. Kyle, J. E. Line, J. D. McKenzie and others, of Gadsden, Ala., and John H. Meyers, of Louisville, Ky.

Anniston & Northern, line from Anniston to Attalla. Incorporators, J. E. Taylor, Anniston, Ala.; Wm. S. Larned, Oreanna, Ala.; J. L. Rowland and John H. Meyers, Louisville, Ky.

Black Creek Short Line, to build around Birmingham, connecting with the Alabama Great Southern and the Georgia Pacific roads. Incorporators, C. B. Ashe, J. G. Morrow, J. E. Webb and others, of Birmingham.

Sheffield & Nashville, from Sheffield to the Tennessee line. Incorporators, W. S. Jordan, Sheffield; A. J. Moses, C. H. Halsey, Huntsville; C. C. Harris, Decatur; H. C. Moses, J. B. Sherrard, Ignatius Pollok and others, Montgomery; C. B. Woodson and others, Atlanta, Ga; Eugene C. Gordon, Clarksville, Tenn.

Sheffield & Seaboard, from Sheffield, Ala., to Tuscaloosa, or to the Georgia Pacific in Walker County, or to the Mississippi line between Columbus and Aberdeen, with branches. Incorporators same as those of the Sheffield & Northern.

Baltimore & Ohio and the Pennsylvania.—On Oct. 10 counsel for the Baltimore & Ohio applied for and obtained a temporary injunction restraining the Philadelphia, Wilmington & Baltimore Co. from refusing to haul its through passenger trains. The case was set for hearing on Oct. 17.

Accordingly the Baltimore & Ohio trains continue to run through, no attempt having been made to stop them. The sale of through tickets by these trains has, however, been stopped in the Pennsylvania offices.

Acting President Garrett has sent a formal protest against the abrogation of the contract under which the through trains have been run. On Oct. 10 he also sent the following letter to Commissioner Fink:

"This company is in receipt of a notice from the President of the Philadelphia, Wilmington & Baltimore Railroad Co., covering a resolution passed by the board of directors of that company on Oct. 3, 1883, a copy of which is herewith inclosed. This action is directed, of course, by the Pennsylvania Railroad Co., which owns a controlling interest in the Philadelphia, Wilmington & Baltimore Railroad, as is evidenced by the circular of the General Passenger Agent of the Pennsylvania Railroad Co., a copy of which is also inclosed. While we regard the proposed action as arbitrary and in violation of the existing agreement between the Baltimore & Ohio Railroad Co. and the Pennsylvania Railroad Co. and propose to hold both the Philadelphia Wilmington & Baltimore and Pennsylvania Railroad companies to their strict legal responsibilities, nevertheless, recognizing the fact that pending the establishment of our rights, an attempt to force passengers over the line between Baltimore and New York would result in great inconvenience to the public, this company is compelled to withdraw from New York and Philadelphia passenger business on and after Oct. 12, 1884, the date fixed by the notice.

"It would now be unremunerative to do this business under the onerous terms and conditions attempted to be imposed by the Pennsylvania Railroad Co. This necessitates the withdrawal of this company from all passenger pools, as they cannot be maintained without participation in the New York and Philadelphia traffic. Notice is therefore hereby given of such withdrawal on and after Oct. 12 next.

"This company strongly deprecates the necessity for the action, and in withdrawing desires to reiterate the position which it has always taken and adhered to strictly—that the greatest safety for the railway properties of the country is to be found in the foundation and strict maintenance of the pool, both passenger and freight, on a basis fair alike to the public and the railways. Irrespective of what the result of the present ill-considered and unwarranted action of the Pennsylvania road may be, this company will continue to pursue the same conservative policy that it has in the past and will be ready at any time, whenever the interest of all parties concerned can be conserved thereby, to form and maintain equitable pools for the protection of all the interests involved, with high penalties for violation of their provisions."

The Baltimore & Ohio offices in New York have ceased to sell through Western tickets *via* Baltimore. They now sell tickets to Chicago by way of the West Shore, the Grand Trunk and the Wabash, their own line being used only from Auburn Junction to Chicago.

Statements have been made by officers of both companies, but they do not contain anything especially new.

Catonsville Short Line.—The rails are reported laid on this road and the ballasting and finishing work are now in progress. It is expected that it will be opened for travel about Nov. 1. The road extends from St. Agnes Station, 5½ miles from Baltimore on the Baltimore & Potomac road, westward to the village of Catonsville, a distance of 6 miles. It will be operated as a branch of the Baltimore & Potomac road.

Central Iowa.—The Boston *Herald* of Oct. 11 says: "The New York report that the payment of this company's coupons had been enjoined at the instigation of Messrs. Chase & Higginson was false. The coupons for October and July are not yet paid, nor were those for January paid by the company. Mr. Sage has a lot of them, which he bought, but they are alive and a debt of the company."

Charleston, Marion & Rutherford.—This project, which is the outcome of some local agitation in the Carolinas, is for the building of a railroad from Charleston, S. C., by way of Gaffney City, Rutherfordton, N. C., Marion and Cranberry, to a connection with the East Tennessee, Virginia & Georgia road near Elizabethtown, Tenn. The distance is about 325 miles, through a country much of which is already occupied by railroads.

Chicago, Freeport & St. Paul.—A dispatch from Galena, Ill., says: "Considerable interest is felt here in the movements of the Chicago, Freeport & St. Paul Railroad Co., which has just completed an inland survey on the east side of the Mississippi, abandoning the proposed route along the river bank on account of the numerous advantages offered by the former over the latter. The interior line runs from Chicago to Freeport in almost an air line, thence northward up the valley of the Pecatonica River, crossing the Wisconsin River near Lime Rock; thence along the north bank of the Wisconsin to Mill Creek, in Richland County; thence northward through Boaz, in Richland County; Sparta, in Monroe County; Melrose, in Jackson County; Whitehall, in Trempealeau County; Durand, in Pepin County, and River Falls, in Pierce County, to a point on Lake St. Croix, in the town of Troy, in St. Croix County; thence in a direct line to St. Paul and Minneapolis."

Cincinnati, Van Wert & Michigan.—It is stated that the funds have been secured for the extension of this road from Cecil, O., northward, and from Greenville southward, and that its agents are now securing the right of way for 55 miles of new road. The older part of the road is now being put in good condition.

Columbus & Rome.—Track on this road is now laid to Stinson, Ga., 4 miles north by east of the late terminus at Sulphur Springs, and 42 miles from Columbus. Tracklaying is progressing steadily towards Greenville, 8 miles from Stinson, to which point the grading is nearly finished.

Danville, Olney & Ohio River.—This road is now, for the first time, earning a surplus over its operating expenses. The Receiver has been able to do something towards putting the road into good condition, and will soon, it is said, be in a position to make some payments on the old debts.

Dayton & Ironton.—This is the name adopted by the purchasing bondholders of the Southeastern Division of the Toledo, Cincinnati & St. Louis for their road. The new company will be organized shortly.

Forest Park & Central.—It is reported that this road has been sold to the Chicago, Burlington & Quincy Co. It is a short suburban line which, by an extension of some 10 miles, including a bridge over the Missouri, might be used as an entrance into St. Louis for the St. Louis, Keokuk & Northwestern road.

Grand Trunk.—This company makes the following statement for August and the two months from July 1 to Aug. 31:

	August—		—Two months.—	
	1884.	1883.	1884.	1883.
Earnings	£299,798	£334,809	£596,358	£645,894
Expenses	219,125	230,390	434,310	445,669
Net earnings	£80.673	£104,519	£162,048	£200,225
Per cent. of exps.	73.0	68.8	72.9	69.0

For the two months the gross earnings decreased £49,536, or 7.7 per cent., while the expenses decreased £11,359, or 2.5 per cent., the result being a decrease of £38,177, or 19.1 per cent., in net earnings.

For the lines west of Detroit and Port Huron for the two months the following statement is made:

	—Chi. & Gd. Trunk.—		—Det., G. H. & Mil.—	
	1884.	1883.	1884.	1883.
Earnings	£110 916	£95,544	£45,183	£46,185
Expenses	87,187	74,957	30,048	30,868
Net earnings	£23,729	£20,587	£15,135	£15,317
Per cent of exps	78.6	78.5	66.8	67.1

The Chicago & Grand Trunk thus shows for the two months an increase of £15,372, or 16 1 per cent., in gross earnings, and of £3,142, or 15 2 per cent., in net earnings. Nearly all the gain in net earnings was made in July. The Detroit, Grand Haven & Milwaukee shows very little change, the gross earnings having decreased £1,002, or 2.2 per cent., while there was a decrease of £182, or 1.2 per cent, in net earnings.

Greenwood, Laurens & Spartanburg.—Tracklaying was recently begun on this road, and the rails are reported down for 8 miles northward from Greenwood, S. C., the starting point, and the terminus of the Augusta & Knoxville road. Most of the grading is done on the entire line of 48 miles from Greenwood to Spartanburg, and tracklaying is progressing steadily.

Gulf, Colorado & Santa Fe.—Surveys are now in progress for an extension of the Montgomery Branch into the pine region of East Texas, and work will soon be begun. The object is to secure traffic from the lumber country.

Illinois Central.—A dispatch from Memphis, Tenn., Oct. 6, says: "Judge Hammond of the United States Court this forenoon delivered his opinion in the case of Lafayette County *vs.* E. P. Neely and others. The complainants, who were stockholders of the Mississippi Central Railroad Co., alleged that this company was one of those to which the State of Tennessee had loaned its bonds for purposes of construction under the internal improvements laws of 1872 and that failing to provide for interest and sinking fund, as required by the act, Governor Porter had the road placed in charge of General Neely as Receiver, who had operated it as such; that whilst in his hands the road was sold and purchased by the Illinois Central Railroad, which paid the debt due the state, and that thereupon General Neely turned over to it a large amount of steel rails and other supplies on hand, and in addition a considerable sum of money, all of which complainants claimed to belong to them as shareholders. The defendants demurred to the bill, which brought up the question of the ownership of the property so turned over by General Neely to the purchasers. The Court sustained the demurrer, and dismissed the bill on its merits, expressly holding that he had acted in accordance with the law and his duty in so turning over the property in his hands, it being, under the circumstances, the property of the purchasers. The opinion further approved General Neely's action throughout, and declared that he acted in strict accord with his duties as Receiver, and there was no just ground for complaint against him at any point. The amount involved aggregated about $105,000."

Joliet, Aurora & Northern.—Agents of this company are to secure the right of way for the proposed line from Joliet, Ill, to Aurora. If the right of way can be secured, work, it is promised, will be begun very soon.

Kansas City, Fort Scott & Gulf.—Contracts have been let for the grading of 40 miles of this company's new Kansas City, Clinton & Springfield road. The sections let extend from Clinton, Mo., northwest to Harrisonville, 40 miles.

It is stated that this company has bought from the Atchison, Topeka & Santa Fe Co. its Pleasant Hill & De Soto Branch, from Olathe, Kan., east to Pleasant Hill, 34 miles. About 30 miles of this can be used as part of the new line to Springfield. The price is not stated. This Pleasant Hill Branch is of very little use to the Atchison Co. It was originally built chiefly as a short connection with the Missouri Pacific.

Officers of this company deny the truth of current reports that a branch is to be built from its Memphis Line to Bird's Point or Cairo.

Lehigh Valley.—Work has been begun on the extension of the State Line & Sullivan road (which this company bought last spring) from Bernice, Pa., to La Porte. This extension is to run beyond La Porte through Muncy to Williamsport, about 45 miles from Bernice.

Long Island.—Notice is given that the Glen Cove Branch bonds maturing Nov. 1 next, will be paid on presentation. There are $150,000 of these bonds outstanding.

Louisville, Evansville & St. Louis.—The Boston *Advertiser* says: "Col. Jonas H. French, President of the Louisville, Evansville & St. Louis Railroad, pronounces the report published in the Boston papers yesterday and to-day, to the effect that a receiver for that road has been applied for, as absolutely and maliciously false. Certain parties, he says, who are in possession of some bonds of the Evansville, Rockport & Eastern Railroad, which is a division of the Louisville, Evansville & St. Louis road, have applied for the appointment of a receiver upon technical grounds only. The statements that the road is badly managed, that the trains are not run on time and that the rolling stock is in bad condition, are all untrue. There are no extraordinary debts, as alleged, hanging over the company, neither is it three months behind in paying its employés. The books of the company are accessible to any one who has the right to examine them. The animus of the whole thing is, Col. French declares, an attempt on the part of a clique acting in the interest of the Evansville & Terre Haute Railroad Co., and which, by some arrangement, claim to control $300,000 of the bonds of the Evansville, Rockport & Eastern road, to accomplish certain purposes of its own. The whole affair will be thoroughly ventilated soon, and the result may prove quite discreditable to the parties who have instigated the receivership suit."

Louisville, New Orleans & Texas.—Through passenger trains between Memphis and New Orleans began to run over this road on Oct. 12. By the first time-table the distance of 455 miles is made in 22½ hours.

The company is encouraging local traffic by putting in sidings at all plantation and other points where local traffic can be collected. All the large sugar plantations between New Orleans and Baton Rouge have their own sidings and stations, and the same policy will be pursued all along the line.

This company has leased the old Clinton & Port Hudson road for five years, with the privilege of buying it at the expiration of that time. The Clinton road extends from Port Hudson, La., on the Mississippi, northeast to Clinton, 21½ miles, and has some local business. It is one of the oldest railroads in the United States, having been built in 1833, and is probably the only railroad in the country which is still laid with the old strap rail on wooden stringers. Some extension of the road is proposed.

Manhattan.—This company made the experiment on Sunday, Oct. 12, of reducing the fares on all the elevated lines in New York to 5 cents all day. The fare is now 5 cents during the "commission hours"—5:30 to 8:30 a. m., and 4:30 to 7:30 p. m.—and 10 cents the rest of the day. At the same time trains were run on the Ninth and Second avenue lines, which has not been done heretofore, only the Sixth and Third avenue lines having been run on Sunday. The number of passengers on the first day of the reduction, compared with the corresponding Sunday last year, was:

	Passengers.	Earnings.
Five-cent fare	216,605	$10,833
Ten-cent fare	151,777	11,833
Difference	I. 64,828	D. $1,000

The working expenses were increased $1,800 by the running of the Second and Ninth avenue lines. The day was not favorable, the afternoon being showery and unpleasant. The reduction will be continued, to give the experiment a fair trial.

Mexican Central.—The earnings and mileage of this road for the nine months of the current year to Sept. 30 have been:

	Earnings.	Mileage.
January	$199,976	861
February	180,322	861
March	234,837	964
April	248,342	1,112
May	265,345	1,236
June	243,443	1,236
July	230,154	1,236
August	240,138	1,236
September	249,954	1,236
Total, nine months	$2,092,511	1,109

The gross earnings for the nine months were thus $1,887 per mile; for September they were $202 per mile.

The amount of government subsidy collected for the six months ending June 30 was $553,240. The collections for the full year 1883 were $1,155,792, and for 1882 they were $969,143. From the middle of September, 8 per cent. of the customs receipts are applicable to the Mexican Central subsidy, against 6 per cent. prior to that date.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Oct. 4:

The bull-fight trains to Toluca are well patronized and will be continued until further notice.

The Mexican Central will begin to-morrow running trains every Sunday to the bull-fights at Cuautitlan. Trains will leave the Buena Vista station at 2:30 p. m. and returning will leave Cuautitlan at 7 p. m. Round trip tickets, including admission to the bull-ring, will be sold at the station.

The men who fired into the Mexican National train near Celaya on Sept. 15 have been arrested, and three have been shot by order of the authorities.

Concessions have been granted for the construction of two railways in the state of Chihuahua, through the efforts of Governor Pacheco, and grading is to be commenced immediately. One line will start from the station of Jimenez, on the Mexican Central, running westerly to Allende, then to Parral, and terminating at Balleza or some other point in the Sierra Madre which may be designated by the Secretary of Public Works. The other starts from Chihuahua, running to Uruachic, Cuiteco or some intermediate point to be determined also by the Secretary of Public Works. They will be narrow-gauge roads, and the estimated cost is $5,000 per kilometre. As the company is to receive $4,000 subsidy from the General Government for each kilometer built and expects an additional subsidy from the state, the enterprise certainly embarks under the most favorable conditions. Of the stockholders who have already subscribed, 203 are in Chihuahua, 127 in Parral and 15 in Huejuquilla. The terms of the concession differ from those which have been granted other railway enterprises, in that the company will enjoy no exemption from duties on material imported for construction, maintenance and operation of its lines, but in exchange it possesses other advantages, one of which is that the Federal Government is to pay the cost of transportation from Europe of the material for construction. The benefit of these two railways to the state of Chihuahua will undoubtedly be very great, as they will place the rich mining districts of the Sierra Madre in direct communication with the Mexican Central, and will provide markets for corn and other products raised in the interior sections, the transportation of which to the capital and other cities of the state is now so expensive that it is almost as cheap to bring corn from San Francisco and Kansas City as from these points. They will also partially open routes of communication with the states of Sinaloa and Sonora, and will form valuable tributaries to the Mexican Central, while the nature of the country which they will open and develop assures a fair profit to the owners.

Minneapolis, Sault Ste. Marie & Atlantic.—Track on this road is now laid from Turtle Lake, Wis., on the St. Paul & Superior line of the Chicago, St. Paul, Minneapolis & Omaha road, eastward through Cameron to Soft Maple, a distance of 35 miles. Grading is about finished to the Chippewa River 9 miles east of Soft Maple, and tracklaying is in progress.

Morristown & New York.—It is stated that work will soon be begun on a railroad from Morristown, N. J., by way of Whippany, Hanover and Caldwell to a connection with the New York & Greenwood Lake road at Cedar Grove. The distance is 16 or 17 miles, through a very picturesque country. The line is nearly the same as that projected for a branch of the Greenwood Lake road, but by making connection with that road at Cedar Grove and using its track through the Great Notch, the expensive tunnel required on the original line will be avoided. The road will, it is stated, be built by an independent company, which has already obtained an agreement from the Greenwood Lake road to haul its trains between Jersey City and Cedar Grove at a fixed rate. The incorporators of the new project include Lambert Speer, Wm. Denyze, Thomas Furrow and Theodore Morrison, of Caldwell, N. J., and others.

Nevada Central.—Default was made Oct. 1 on the coupons then due on the $750,000 first mortgage bonds of this road. The road extends from Battle Mountain, Nev., to Austin, 93 miles, and is controlled by the Union Pacific Co. In his last report, President Adams, of that company, recommended that no more advances should be made, and that the road be left to the bondholders, and it is doubtless in accordance with this advice that the default has been made.

New Brunswick.—At the recent annual meeting the statements presented showed that the company now operates 447 miles, and the gross earnings for the year ending June 30 were $635,850, or $1,422 per mile. The passenger earnings increased 9 per cent. and the freight earnings 6 per cent. The small increase was chiefly due to depression in the lumber business. The total number of pasengers carried was 169,943; carried one mile, 19,879,707; average rates per passenger mile 2.05 cents. The total quantity of freight carried was 211,258—carried one mile 13,874,200 tons; average rate per ton mile, 2.65 cents.

On improvements there were expended during the year $68,765. About 5,000 tons of rails were laid down on the St. John & Maine section, completing the equipment of that part of the line with steel rails. Extensive repairs have been made on the track and the bridges, including 30,000 new ties. Twenty miles of the road between Watt Junction and St Andrews have been relaid with the best of the iron taken from other portions of the line. The bridges generally have been thoroughly overhauled. In order to carry on the work more economically it was found necessary to remove the machinery from the shops at St. Andrews to McAdam.

New York Central & Hudson River.—The new 5 per cent. debenture bonds to the amount of $6,500,000 are offered for subscription by Drexel, Morgan & Co. in New York; Drexel & Co. in Philadelphia, and J. S. Morgan & Co. in London The subscription opened Oct. 16 and will be closed on notification from London. The bonds are offered at 102 and interest, payable 10 per cent. at time of subscription and the balance by Nov. 1. They will be issued either as coupon or registered bonds.

New York & Greenwood Lake.—It is stated that a connecting track will be built from this road to the Newark Branch of the New York, Lake Erie & Western at Woodside, N. J., and that all through trains will be run into Jersey City over the Newark Branch, the old track between Woodside and the Bergen Tunnel being used for local trains only. The object is to secure a station in Newark, from which city the road receives considerable business. This plan was proposed two or three years ago, but was then given up on account of some trouble about the right of way and the street crossings on the connecting track.

New York, Lake Erie & Western.—This company makes the following statement for August and the eleven months of the fiscal year from Oct. 1 to Aug. 31, the figures including 68 per cent. of the gross earnings of the leased New York, Pennsylvania & Ohio, and all the working expenses of that road:

	August.		Eleven months.	
	1884.	1883.	1883-84.	1882-83.
Earnings	$1,861,214	$2,580,956	$19,533,060	$20,189,113
Expenses	1,221,038	1,480,891	15,142,379	13,868,861
Net earn..	$640,176	$1,100,065	$4,390,681	$6,320,252

This shows for the eleven months a decrease of $656,053, or 3.2 per cent., in gross earnings, with an increase of $1,273,518, or 9.2 per cent., in expenses, and a decrease of $1,929,571, or 30.5 per cent., in net earnings. The New York, Pennsylvania & Ohio is included for the whole year this year, but only from May 1 (four months) last year.

The earnings of the Erie lines proper, excluding all earnings and expenses of the New York, Pennsylvania & Ohio, were:

	August.		Eleven months.	
	1884.	1883.	1883-84.	1882-83.
Earnings	$1,534,427	$2,068,464	$15,886,237	$18,469,528
Expenses	913,193	1,099,943	18,182,965	12,435,962
Net earnings	$621,234	$968,521	$4,703,272	$6,033,566
Per cent. of exps.	59.5	53.2	70.5	67.3

This shows for the eleven months a decrease in gross earnings of $2,583,291, or 14.0 per cent., with a decrease in expenses of $1,252,997, or 10.1 per cent., and a resulting decrease of $1,330,294, or 22.0 per cent. in net earnings.

A comparison of the two statements shows that the 68 per cent. of the gross earnings of the New York, Pennsylvania & Ohio amounted to $326,787 for August, and $3,646,823 for the eleven months, while its working expenses were $307,845 and $3,959,414 for the same periods, showing a direct gain of $18,942 on the lease in August, but a loss of $312,591 for the eleven months.

New York & Long Branch.—Counsel for the Pennsylvania Railroad Co. have applied to the United States Circuit Court to have the suit against the New Jersey Central, under the old contract for the use of this road, sent back to the examiner to take further testimony. The court set Oct. 28 for a hearing.

New York & New England.—The special meeting was continued from day to day by adjournment until Oct. 15, when a majority of the stock had been polled, in favor of the resolutions authorizing the issue of the preferred stock in settlement of floating debt claims, and accepting the provisions of the acts recently passed authorizing such issue. The polls are, however, to be kept open a few days longer to avoid all objections.

New York, New Haven & Hartford.—In the Superior Court in New Haven, Conn., last week Henry L. Goodwin, a stockholder, brought suit against the directors of the company, asking the Court to declare void the purchase in 1881 of the majority of the stock of the New Haven & Northampton Railroad by the New York, New Haven & Hartford Co. The directors file a plea in abatement that Goodwin's action is prompted by malice, that purchase was necessary and that it has been approved by a stockholder's meeting.

New York, Philadelphia & Norfolk.—Track on this road is now laid to Eastville, in Northampton County, Va., 12 miles south of the late terminus at Franktown, and 60 miles from Pocomoke, where the new extension begins. About 13 miles remain to reach the terminus at Cherrystone, or Cape Charles City, as it is to be called, and this is to be completed this month.

The company has contracted for two iron ferryboats to be used for transferring passengers and freight cars between Cape Charles City and Norfolk. Until they are completed a chartered boat will be used.

Northern Pacific.—The following statement is made for August and the two months of the fiscal year from July 1 to Aug. 31:

	August.		Two months.	
	1884.	1883.	1884.	1883.
Earnings	$1,037,602	$1,043,624	$2,055,040	$1,893,847
Expenses	609,063	652,270	1,201,720	1,285,825
Net earnings..	$423,539	$391,354	$853,320	$608,022
Per cent. of exps	59.0	62.5	58 5	67.9

For the two months there was an increase in gross earnings of $161,193, or 8.5 per cent., with a decrease in expenses of $84,105, or 6.5 per cent., the result being a gain of $245,298, or 40.3 per cent., in net earnings. The notable point in the statement is the large reduction in expenses.

Ohio Central.—At a meeting of stockholders and bondholders in New York, Oct. 10, a resolution was adopted providing for the appointment of a committee of five, three of whom shall represent the first-mortgage terminal bonds, one the second-mortgage income bonds and one the stockholders of the Ohio Central main line, to protect the interests of the holders of the securities of the main line and terminals of the railway at the foreclosure sale, and to devise a plan of reorganization to be submitted to the holders of the securities of the road for their approval. This committee was authorized to take such steps as were necessary to secure a postponement of all proceedings with reference to the foreclosure of the road until such plan of reorganization shall have been submitted and considered. The following committee was appointed: C. W. Opdyke, Grinnell Burt, D. B. Halstead, J. S. Stanton and Charles J. Canda.

Ohio & Mississippi.—In Cincinnati, Oct. 9, the annual meeting of stockholders and bondholders was held for the election of three dirrctors. The dispatch states that the directors appointed Messrs. Hersey, Goodwin and McAuley tellers. This was objected to by the attorney for what is known as the anti-Garrett party, who wanted the tellers elected by the meeting. Objections were also made to the proxies offered by the Garrett party. The tellers decided to receive them subject to the objection, which would be considered afterward. This was also made the subject of exception.

President Peabody's report, after detailing the action taken to restore the road to the stockholders, says: "The total present funded debt is $15,442,000, the annual interest on which is $1,040,000. The sinking fund contribution is $49,000; while the gross earnings during the five months ending Sept. 1, the period when the company resumed possession, have decreased over $200,000 compared with the same period last year, a net decrease is shown of only $8,000. The general condition of the road has been maintained, and large additions to the equipment have been ordered."

After remaining in session all the afternoon, the meeting adjourned till 7:45 p. m. The principal dispute was as to the right of the holders of the Springfield Division bonds to vote, the English party asserting that the only bonds having the right to vote are those of the main line from Cincinnati to St. Louis. Another question raised was in regard to the registration of bonds. It was alleged that a person should not be registered to vote unless he produced the bonds himself or gave further evidence than the certificate and his own statement that he was the owner of the bonds. At 1:45 a. m. the inspectors of election reported that the balloting had resulted as follows: For Baltimore & Ohio interest, so called, 175,493; for opposition, or English interest, 149,991. The new directors immediately organized by electing the old officers. Immediately after the election the newly-elected officers were served with a notice of *quo warranto* suits brought by the English interest. The three directors elected are F. W. Tracy, James Sloan, Jr., and Edward Higgins, Jr.

It is said that only 19,000 votes were cast on Springfield Division bonds, so that the directors chosen would have a majority, even if those votes should be thrown out.

Oregonian.—A dispatch from Portland, Oregon, says that the United States District Court there has given a decision sustaining the validity of the lease of this road to the Oregon Railway & Navigation Co. The lessee, it will be remembered, recently refused to make any more payments under the lease, claiming that it was not legally made.

Philadelphia & Reading.—The Receivers' cash account for August is as follows:

	Railroad Co.	Coal & Iron Co.
Balance, Aug. 1	$212,983	$34,709
Receipts from all sources	3,319,603	1,537,611
Total	$3,532,586	$1,572,320
Disbursements	3,306,054	1,537,393
Balance, Sept. 1	$226,532	$34,927

The receipts for the railroad include $130,000 receivers' certificates paid out for wages.

The reports that Mr. Vanderbilt has been selling the 50,000 shares of New Jersey Central stock which he had undertaken, it was said, to carry for this company, prove to be true. This stock was bought by the Reading Co. at 78, and when the company could carry it no longer, it was transferred to Mr. Vanderbilt. It now appears that the transaction with him was simply a time loan with the stock pledged as security. The company was unable to repay the loan when it matured, and Mr. Vanderbilt accordingly sold out the stock as he could, in smaller lots, at prices ranging from 57 down to 50. The company has thus lost something like $1,400,000 by this transaction, besides all the advantages which it expected to gain from a large holding of the stock of its leased line. The sale is taken generally as an indication that Mr. Vanderbilt does not intend to help the company any further for some reason, either because he does not approve of the present management, or because he considers it past help.

If the latter should be the true reason it would give some color to the reports that he is buying up the consolidated bonds, expecting to control the re-organization when the road is sold under foreclosure, as now appears inevitable.

Pittsburgh & Lake Superior.—This proposed road is not quite so long as its name would indicate. It is a short line which the Pittsburgh & Lake Superior Iron Co. intends building, to connect its iron mines near Negaunee, Mich., with the Marquette & Western road.

Reading & Chesapeake.—An effort is to be made to secure funds for the building of this road, which was surveyed some two years ago. The projected line is from Reading, Pa., to a point on Chesapeake Bay near the mouth of the Susquehanna.

St. Louis, Topeka & Northwestern.—This company has been organized to build a railroad from Topeka, Kan., to the coal fields of Southeastern Missouri, on the line projected by the St. Louis, Emporia & Western Co., organized some time ago.

Texas Central.—This company has executed a general mortgage to secure an issue of 6 per cent. bonds at the rate of $25,000 per mile. The new bonds are to be used to retire existing issues and to provide funds for extensions and improvements of the road. The company, which is controlled by the Houston & Texas Central Co., owns 229 miles of completed road.

Texas & Pacific.—The Philadelphia *Ledger* of Oct. 14 says: "The bondholders of the Texas & Pacific Railway are becoming much dissatisfied with the condition of the business and finances of that company. Its securities are largely held in Philadelphia, and we are informed that a movement has been initiated for the appointment of a committee to take into consideration the condition of the road and recommend the best course of action to be taken by the bondholders. This committee consists of Major Frank S. Bond, John A. Wright, John P. Hutchinson, General Isaac J. Wistar and William L. Dubois. There are about thirty millions of mortgage bonds outstanding of various issues by the Texas Pacific Railway, and of these some fifteen millions are held in Philadelphia and Baltimore. The bondholders are now signing a paper giving the necessary authority to the above committee, and we are informed that already signatures by holders of most of the bonds here and in Baltimore have been obtained. The usual call for the redemption of 2 per cent. of Texas Pacific first-mortgage bonds for the sinking fund, which should be made Oct. 1, we understand has not yet been made, and will probably be passed."

Toledo, Cincinnati & St. Louis.—The Receiver reports total cash receipts for August $66,480, and disbursements of $58,230, leaving a balance of $8,250 on hand Sept. 1.

The Southeastern Division bondholders met in Boston, Oct. 11, and considered the plan for reorganization of their new company, which was finally referred to an adjourned meeting. The plan of organization contemplates the issue of first-mortgage 6s to the amount of $7,500 per mile on 156 miles, the proceeds to be used for making the road standard gauge and supplying equipment. The present first-mortgage bonds ($2,250,000) and the coupons for 1883-84 are to be exchanged for preferred stock, par for par, the present income bonds (also $2,250,000) are to be converted into common stock on payment of 5 per cent., and it is provided that the whole amount of the new common stock shall be held in trust until the preferred stock shall have received five consecutive dividends of 6 per cent., and the common stock two consecutive dividends of 3 per cent. The preferred stock will be issued directly to the bondholders. In lieu of receiving common stock, the income bondholders will receive scrip convertible into said stock after the payment of dividends as above. The privilege of exchanging securities extends 90 days from Nov. 1, or to Feb. 2, 1885.

Vermont Railroads.—The Railroad Commissioner of Vermont in his annual report to the Legislature of that state, just completed, gives the following summary of facts regarding the capital stock, debt, general traffic, earnings, operating expenses and the general condition of the railroads within the limits of the state. The aggregate capital stock invested is $22,758,300, the funded debt $19,230,900, and the total cost of construction and equipment $41,028,915. The total number of miles of railroad now in operation in Vermont is 946 of main line and branches and 109 of siding and other track, represented by 23 companies. There are 255 railroad stations in the state.

Miles run by passenger trains	2,727,803
Miles run by freight trains	5,198,011
Miles run by construction and other trains	590,185
Miles run by all classes of trains	8,515,939
Total tons freight carried one mile	559,971,099
Total passengers carried one mile	132 571,619
Total passengers carried	6,219,711

The total receipts from all sources, as reported by the several roads, amount to the sum of $12,058,679, of which $3,938,682 were from passengers, $7,553,813 from freight and the balance from other sources. The total working expenses were $7,002,686; taxes, $123,802; total $7,126,488; leaving the net earnings $4,932,191.

The total amount of business for the two years last passed shows a very large increase over the two preceding years.

Dividends to the amount of $1,136,816 have been paid by the roads reporting for the biennial period.

During the two years last past 28 persons were killed by accidents on the railroads in the state.

Vicksburg, Shreveport & Pacific.—This company, it will be remembered, owns some 20 miles of track, from Shreveport, La., west to the Texas line, which was built some 18 years ago and has been operated by the Texas & Pacific Co. under a lease which will shortly expire. It is now stated that an agreement has been concluded for a new lease, both companies to use the road together. This will prevent the building of a new line by the Texas & Pacific

Wabash, St. Louis & Pacific.—The Receivers give notice that the coupons which became due Sept. 1 on St. Louis, Kansas City & Northern real estate bonds will be paid Oct. 20, on presentation at the National Bank of Commerce in New York. Interest due Sept. 1 on Wabash scrip certificates will also be paid Oct. 20 at the Metropolitan National Bank in New York.

In London, England, Oct. 10, President Joy addressed a meeting of the stock and bond holders. He said that the peril of the Wabash road was caused by its acquiring more lines than it was justified in doing. The road had a good future, but was unable to raise money to pay its floating debt and remain a harmonious corporation. The alternatives were a Receiver, a hostile foreclosure, or an amicable arrangement. He recommended the conversion of the debt, which, he said, would leave the road in a good condition to earn enough to pay its fixed charges and very soon to pay interest on all of its bonds, including the interest on the income bonds embraced in the proposed reorganization. At Mr. Joy's request the meeting appointed a committee to consider the subject of the reconstruction of the road.

Mr. Joy's reception was not altogether cordial, and some very pertinent questions concerning the plan of reorganization and the past management of the company were put to him.

Wisconsin Central.—On the new extension to St. Paul the track is now laid to the Chicago, St. Paul, Minneapolis & Omaha crossing at New Richmond, Wis., 19 miles westward from the last point noted and 68 miles from the starting point at Chippewa Falls. Work on the bridge over the St. Croix River has been delayed by high water, but will soon be resumed.